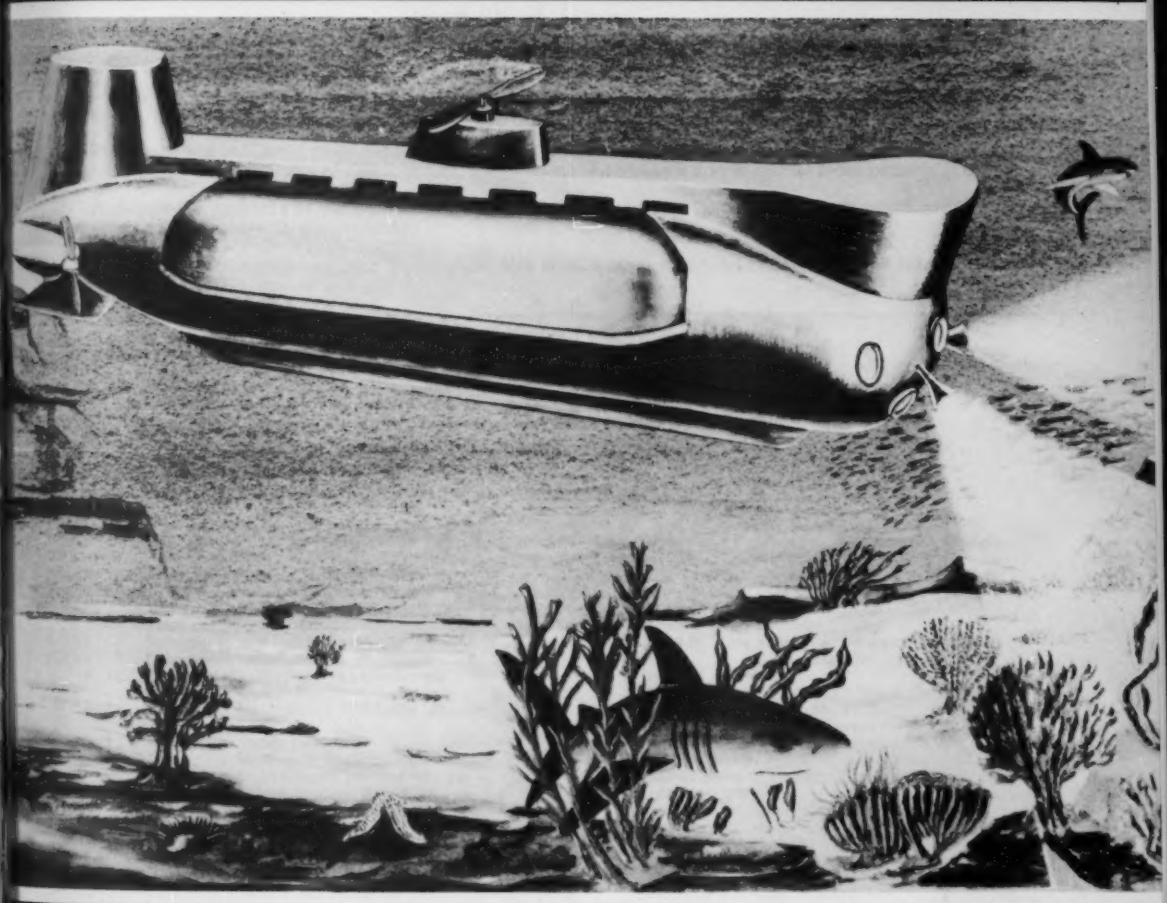
DIV. OF FISHES

COMMERCIAL FISHERIES REVIEW

THE UNIVERSITY OF MICHIGAN
APR 25 1962
MUSEUMS LIBRARY



L. 24, NO. 3 MARCH 1962

FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.

DEPOSITED BY THE
UNITED STATES OF AMERICA

UNITED STATES
DEPARTMENT OF THE INTERIOR
STEWART L. UDALL, SECRETARY

FISH AND WILDLIFE SERVICE
CLARENCE F. PAUTZKE, COMMISSIONER

BUREAU OF COMMERCIAL FISHERIES
DONALD L. MCKERNAN, DIRECTOR

DIVISION OF RESOURCE DEVELOPMENT
RALPH C. BAKER, CHIEF

COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

Publication of material from sources outside the Bureau is not an endorsement. The Bureau is not responsible for the accuracy of facts, views, or opinions contained in material from outside sources.

Although the contents of the publication have not been copyrighted and may be reprinted freely, reference to the source is appreciated.

Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, May 10, 1960.

5/31/63

CONTENTS

COVER: An artist's sketch of an aluminum research submarine, the Aluminaut, designed to explore the ocean at depths many times beyond the limit of existing subs. The Aluminaut will permit man to explore about 60 percent of the world's ocean floor--most of it for the first time (see Commercial Fisheries Review, February 1962 p. 33).

Page
1 . .Blue Crab Trawl Fishery of Georgia, by Robert Cummins, Jr., and Joaquim B. Rivers
7 . .Comparison of pH, Trimethylamine Content, and Picric Acid Turbidity as Indices of Iced Shrimp Quality, by Sammie Bethea and Mary E. Ambrose

Page
TRENDS AND DEVELOPMENTS:
California:
11 . . Pelagic Fish Population Survey Continued
12 . . Dungeness Crab Studies Continued
13 . . Rockfish Tagging Studies Continued
Cans:
13 . . Shipments for Fishery Products, January-November 1961
14 . . Aluminum-Alloy Cans
Federal Purchases of Fishery Products:
14 . . Department of Defense Purchases, 1961
15 . . Veterans Administration Requirements for Canned Fish from New Packs
Fish Bone Detection:
15 . . Automatic Bone Detection and Rejection System Feasible
Fish Oils:
16 . . Effect of Dietary Fish Oils on Blood Cholesterol
16 . . Investigation of Chemical Compounds Causing Fishy Flavors and Odors
17 . . Applied Research on Effect of Components on Healing of Skin Lesions
Frozen Fish:
17 . . Microwave Thawing
Gear:
17 . . Location of Detachable Cod Ends
Great Lakes Fishery Investigations:
18 . . Whitefish Spawning Survey in Apostle Islands Area of Lake Superior Continued
Gulf Fishery Investigations:
19 . . Shrimp Distribution Studies

Page
TRENDS AND DEVELOPMENTS (Contd.):
Hawaii:
19 . . Skipjack Tuna Landings, January-December 1961
Industrial Products:
19 . . Major Indicators for Fish Meal, Solubles, and Oil, December 31, 1961
20 . . U. S. Fish Meal and Solubles--Production and Imports, January-November 1961
Maine Sardines:
21 . . Canned Stocks, January 1, 1962
North Carolina:
21 . . "Sea Bed Drifters" Released Along North Carolina Shore
Oregon:
22 . . Chinook Salmon Eggs Planted in Coos River
Oysters:
22 . . Shellfish Mortality Conference
22 . . United States Commercial Fishery Landings, 1961
24 . . U. S. Production of Fish Sticks and Portions, 1961
U. S. Fishing Vessels:
25 . . Documentations Issued and Cancelled, December 1961
U. S. Foreign Trade:
26 . . Shrimp Imports, 1960-61
26 . . United States Exports and Re-Exports of Frozen Shrimp to Japan, January-October 1961
27 . . Imports of Canned Tuna in Brine Under Quota
27 . . Edible Fishery Products, December 1961

Contents continued page II.

CONTENTS (CONTINUED)

Page
TRENDS AND DEVELOPMENTS (Contd.):
27 .. Wholesale Prices, January 1962
Virginia:
28 .. Scientists Forecast Decline in Blue Crab Fishery
FOREIGN:
International:
Northwest Atlantic Fisheries Commission:
30 .. Poland Adheres to Northwest Atlantic Fisheries Convention
International Pacific Salmon Fisheries Commission:
30 .. Sockeye and Pink Salmon Fisheries Regulations in Convention Waters for 1962
Pacific Science Congress:
31 .. Tenth Congress Resolutions Include Several on Fisheries
International Northwest Pacific Fisheries Commission:
32 .. Soviet-Japanese Technical Talks End
International North Pacific Fur Seal Commission:
32 .. Fifth Annual Meeting
Marine Oils:
34 .. Estimated World Production in 1962
35 .. Atomic-Propelled Marine Research Vessel
Canada:
35 .. British Columbia Shucked Oyster Production, 1961
35 .. Brine Shrimp Industry in Saskatchewan
Ceylon:
36 .. State Corporation for Fishing Industry Proposed
Chile:
36 .. United States $5 Million Loan to Chile for Fishery Project Approved
Denmark:
37 .. Fishing Limits Discussed by Fisheries Minister
Faroe Islands:
37 .. Fishery Factoryship Planned
38 .. Exports of Fresh, Frozen, and Salted Fish
German Federal Republic:
38 .. Fish Oil Market
38 .. Fish Meal Prices, January 5, 1962
39 .. Government Aid for Fishing Industry
Guinea:
40 .. Market for Canned Sardines
Iceland:
41 .. Five Fish-Freezing Plants Form New Export Association
41 .. New Fish Pricing Board Established
42 .. Frozen Herring Sales
Ivory Coast:
42 .. Japanese-Italian Joint Tuna Base Planned
Japan:
42 .. Producers Recommend 100,000-Ton Quota for Frozen Tuna Exports to U. S.
43 .. Tuna Prices to Catcher Vessels in Mothership Fishery
43 .. Tuna Mothership Companies to Request Liberalization of Fishing Restrictions
43 .. Canned Tuna Sales for Export to United States
43 .. Exports of Canned Tuna Specialty Packs
44 .. Penang and Singapore Proposed as Tuna Transshipment Bases
44 .. Research Vessel to Explore Indian Ocean Tuna Resources

Page
FOREIGN (Contd.):
Japan (Contd.):
44 .. Shrimp Factoryship Operation Planned in Bering Sea in 1962
45 .. African Fishery Investments Sought
45 .. Trawlers Fishing off South Africa
45 .. Two Stern Trawlers Being Built
46 .. Government Asks for More Money for Fishery Regulations Enforcement
46 .. Government Loans for Promotion on Export Trade
46 .. More Money for Sales Promotion of Food Products
Malaya:
47 .. Joint Japanese-Malayan Tuna Canning Operation at Penang
Mexico:
50 .. Severance Tax Changed on Some Shrimp Products
50 .. Import Duties on Edible Fishery Products Increased
Nicaragua:
51 .. Shrimp Fishery Trends
Norway:
51 .. Dismal Prospects for Winter Herring Fishery
51 .. Fish Finder Has Limited Use in Tuna Fishery
Peru:
52 .. Fish Meal Industry Trends
52 .. Most Fish Meal Plants Reported Shut Down
53 .. Fish Meal Plants Operating Again
Philippines:
53 .. Government's Economic Reform Affects Fishery Products Imports
Portugal:
53 .. Canned Fish Pack, January-September 1961
54 .. Canned Fish Exports, January-September 1961
Spain:
54 .. Tuna Fishing Industry
Sweden:
54 .. Herring Boning Machine
Taiwan:
55 .. Fishery Landings Continued to Increase in 1961
55 .. Night Fishing with Purse Seines Successful at Suao
55 .. Loan for Construction of Tuna Long-Liners--All articles under Taiwan are by T. P. Chen
U. S. S. R.:
55 .. Fishery Catch Sets New Record in 1961
United Kingdom:
56 .. Export Combine Formed by Ten Leading Fish Processors
56 .. Underwater Remote Control Camera Developed to Study Fish Behavior
57 .. Information on London Trade Center and British Food Fairs for Exhibiting U. S. Fishery Products
58 .. Fishery Loans Interest Rates Revised
FEDERAL ACTIONS:
Department of Commerce:
Area Redevelopment Administration:
59 .. Industrial Loan to Florida Canning Firm Approved
Department of Health, Education, and Welfare:
Food and Drug Administration:
59 .. Standard of Identity for Fish Flour Approved

Contents continued page III.

CONTENTS (CONTINUED)

Page
FEDERAL ACTIONS (Contd.):
Department of Labor:
Wage and Hour and Public Contracts Division::
62 .. Interpretive Bulletin Issued on Minimum Wage and Overtime for Fishing and Fishery Processing
Department of the Treasury:
Bureau of Customs:
76 .. Groundfish Fillet Import Tariff-Rate Quota for 1962
76 .. Eighty-Seventh Congress (Second Session)
FISHERY INDICATORS:
80 .. Chart 1 - Fishery Landings for Selected States
81 .. Chart 2 - Landings for Selected Fisheries

Page
FISHERY INDICATORS (Contd.):
82 .. Chart 3 - Cold-Storage Holdings and Freezings of Fishery Products
83 .. Chart 4 - Receipts and Cold-Storage Holdings of Fishery Products at Principal Distribution Centers
83 .. Chart 5 - Fish Meal and Oil Production - U. S. and Alaska
84 .. Chart 6 - Canned Packs of Selected Fishery Products
85 .. Chart 7 - U. S. Fishery Products Imports
RECENT FISHERY PUBLICATIONS:
86 .. Fish and Wildlife Service Publications
88 .. Miscellaneous Publications

SOME USES FOR WHALE SPERM OIL

Researchers for a large oil refining firm have developed new uses for sperm whale oil. They found, among other things, that sperm oil is a good lubricant for engines because the viscosity changes very little at wide ranges in temperature. This also makes it valuable as a liquid in new fluid-drive transmissions. It does not dry like linseed or turn rancid like cottonseed oil. It can be processed in a number of different ways for different uses. It has high film strength and can loosen a rusted nut on a bolt in seconds. Jewelers pay about $5 an ounce for the sperm oil they use to lubricate watches.

Sperm oil, which is more of a liquid wax than an oil, has become essential to a number of industries. It is used to impart a rich, glossy sheen to cosmetics such as facial creams. It gives softness and flexibility to leathers. In textiles, sperm oil lubricates the fibers to prevent unraveling as they are twisted into threads. It is used in detergents, wetting agents, fiber softeners, hand soaps, rust-proofing compounds, and scores of other products linked with the ever-growing chemical industry. (Maine Coast Fisherman, Vol. 11, No. 4, November 1956.)

Editorial Assistant--Ruth V. Keefe

Compositors--Jean Zalevsky, Alma Greene, Helen Paretti, and Raie Carron

* * * * *

Photograph Credits: Page by page, the following list gives the source or photographer for each photograph in this issue. Photographs on pages not mentioned were obtained from the Service's file and the photographers are unknown.

Pp. 20 & 23--F. B. Sanford and C. F. Lee; p. 32--V. B. Scheffer.

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.
Price 60 cents (single copy). Subscription Price: $5.50 a year; $2 additional for foreign mailing.

COMMERCIAL FISHERIES REVIEW

March 1962 Washington 25, D. C. Vol. 24, No. 3

BLUE CRAB TRAWL FISHERY OF GEORGIA

By Robert Cummins, Jr.*, and Joaquim B. Rivers*

SUMMARY

A year-round trawl fishery for blue crabs is conducted in the coastal waters of the South Atlantic States. Off Georgia, the sheltered bays and sounds close to the home ports of the trawlers are the trawling grounds. Consequently, weather seldom interferes with fishing and trips can be kept short. From June through December the trawlers drag small-mesh nets for both shrimp and crabs; from January through May, when shrimp are scarce, large-mesh nets are dragged solely for crabs. A good double-rigged trawler can average approximately 1,500 to 2,000 pounds of crabs a day. Most of the trawl-caught blue crabs from the grounds off Georgia are processed in Brunswick.

BACKGROUND

Blue crabs (Callinectes sapidus) are the basis for one of the most stable commercial fisheries of the South Atlantic States. In 1959, over 32 million pounds of crabs, worth roughly $1.7 million ex-vessel, were landed in ports in North and South Carolina and Georgia (Power 1961).

Conventional blue crab gear and fishing methods have been described by Andrews (1947), Cargo (1954), and Wharton (1954) from observations made in the Chesapeake Bay States. Gear described by one or more of those authors includes pots, trotlines, scrapes, dredges, fyke nets, haul seines, push nets, and dip nets.

Blue crab fishing in the South Atlantic States, however, is unique in that specially designed crab trawls are used in addition to pots and trotlines. The trawl fishery for blue crabs has never been adequately described.

This article is based on observations of the blue-crab trawl fishery as it is carried out in coastal waters of Georgia. In general features at least, the descriptions of trawling methods and gear are applicable also to crab trawling in North and South Carolina.

Fig. 1 - Hauling aboard a crab trawl laden with "grass."

THE FISHERY

The fishery operates year-round. From June through December, both shrimp and crabs are fished, and small mesh nets are used. From January through May, owing to a usual gen-

*Fishery Methods and Equipment Specialists, Branch of Exploratory Fishing, Division of Industrial Research, U. S. Bureau of Commercial Fisheries, Brunswick, Ga.

U. S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
SEP. NO. 642

eral scarcity of shrimp, only crabs are fished, and there is a general switch to larger mesh nets.

GROUNDS: Crab trawling is conducted, primarily, in sheltered bays and sounds along the coast of Georgia where, except for occasional fog, fishing is seldom stopped by bad weather. Fishing depths seldom exceed 50 feet. Few obstructions interrupt the mixture of sand, mud, and clay that uniformly characterizes the coastal grounds, and home ports for the trawlers are rarely far distant. Principal drawbacks to crab trawling in the area are: (1) large amounts of "grass" (fig. 1) and jellyfish that, when caught, clog the trawls and occasionally cause some gear damage; and (2) the presence in early summer of loggerhead turtles and large numbers of stingrays that make handling the catch more difficult and that also occasionally cause gear damage.

FISHING OPERATION: Fishing is done from conventional shrimp vessels of the types described by Sundstrom (1957) and Knake, Murdock, and Cating (1958). The procedure followed varies only slightly from shrimp fishing. The boats arrive on the grounds near daylight, and the trawls are set, usually with a warp-scope ratio of 5:1 (5 feet of trawl warp for every 1 foot of water depth). Average dragging time is 2 hours, after which the gear is retrieved. The bag is tripped (fig. 2), and most of the catch falls on deck (fig. 3). Crabs clinging to the webbing (fig. 4) are knocked loose with a stick ("crab knocker"), and the emptied trawl is reset immediately. Only after resetting does sorting of the catch begin. When only crabs are fished, 3 to 4 drags are considered a day's work, and the vessel usually returns to port late in the afternoon. When shrimp as well as crabs are fished, the working day is usually longer, and trips may last 2 to 3 days.

Fig. 2 - "The moment of truth"--tripping the bag.

Fig. 3 - Catch of a Georgia crab trawl on deck.

Fig. 4 - Blue crabs and a horseshoe crab tangled in the trawl webbing.

CRAB CATCHES AND CRAB PRODUCTION: Catches vary widely. As many as 2,800 pounds of crabs have been reported from a single 1-hour drag. But the average catch, from the usual 2-hour drag with a single 55- to 60-foot trawl appears to be close to 250 pounds. Double-rigged vessels would, therefore, average roughly 500 pounds in a 2-hour drag, or 1,500 to 2,000 pounds daily (fig. 5).

Wharton (1954) states that the average daily catch from 50 chicken-wire crab pots in the Chesapeake Bay is between 200 and 500 pounds. A double-rigged vessel making 4 drags a day could be expected to average as many crabs as could be caught on the average with 150 to 500 pots (assuming that differences in availability of crabs between the Chesapeake and the coast of Georgia can be disregarded).

A good crab trawler, operated by a crew of two men, can expect to stock $110 in crabs in two days. Half of this goes to the vessel. Additional stock is obtained from seasonal shrimp catches and from the small amounts of food fish that are taken incidentally.

Table 1 - Blue Crab Landings in Georgia[1/]

Year	Total Landings, all Gear	Trawl Landings	Portion of Landings Caught by Trawling
	(Pounds)		Percent
1960	15,766,000	2,576,700	16
1959	12,682,500	4,192,600	33
1958	10,185,000	3,658,300	26
1957	8,968,000	2,067,000	24
1956	8,542,000	2,140,800	25
1955	10,745,000	2,012,500	19
1954	10,640,000	2,259,400	21
1953	9,486,000	1,985,000	21
1952	9,458,200	4,410,400	47
1951	6,526,400	1,535,000	24
1950	5,027,600	1,045,000	21

1/From Fishery Statistics of the United States, U. S. Fish and Wildlife Service, 1950-59.

Fig. 5 - A good day's catch (2,500 pounds of blue crabs) being unloaded at a Georgia plant.

The percentage of total crab landings due to trawling varies from year to year (table 1) as does the number of vessels engaged in the crab trawl fishery. Availability of other, more profitable, fishery resources is apparently a major determining factor.

PORTS: Most of the crabs caught along the coast of Georgia are processed in Brunswick in the largest processing plant in that State. Some crabs are landed directly in Brunswick; others are landed in the northern part of the State, especially in Thunderbolt, and are either trucked to Brunswick or processed locally.

FISHING GEAR

Gear used in the trawl fishery for blue crabs is nearly identical with that used in the shrimp fishery. The principal difference lies in the larger mesh (4-inch stretched mesh) used in crab trawls only when crabs are fished. Large mesh nets are favored, for they can be repaired more easily and cheaply than small mesh nets, and they allow small fish and shrimp to escape more readily. Also, many fishermen believe that large mesh nets spread better and fish a larger area than do small mesh nets. When both shrimp and crabs are fished, nets similar in size to shrimp trawls are used.

Gear combinations vary widely in the crab fishery, just as Juhl (1961) has shown they do in the shrimp fishery. Combinations used in the crab fishery range from 50-foot nets and $6\frac{1}{2}$-foot doors pulled by 35-foot single-rigged vessels, to 96-foot nets and 9-foot doors pulled by 55- to 60-foot single-rigged vessels, and twin 45- to 50-foot nets and $7\frac{1}{2}$-foot doors pulled by 55- to 60-foot double-rigged vessels. The most popular nets used in the crab fishery are similar to the 4-seam shrimp trawls described by Bullis (1951).

CONSTRUCTING A 57-FOOT CRAB TRAWL: Materials needed for a 57-foot 4-seam crab trawl are listed, with their approximate (1961) prices, in table 2. The starting point for trawl construction is a rectangular piece of webbing, 373 meshes long by 100 meshes deep

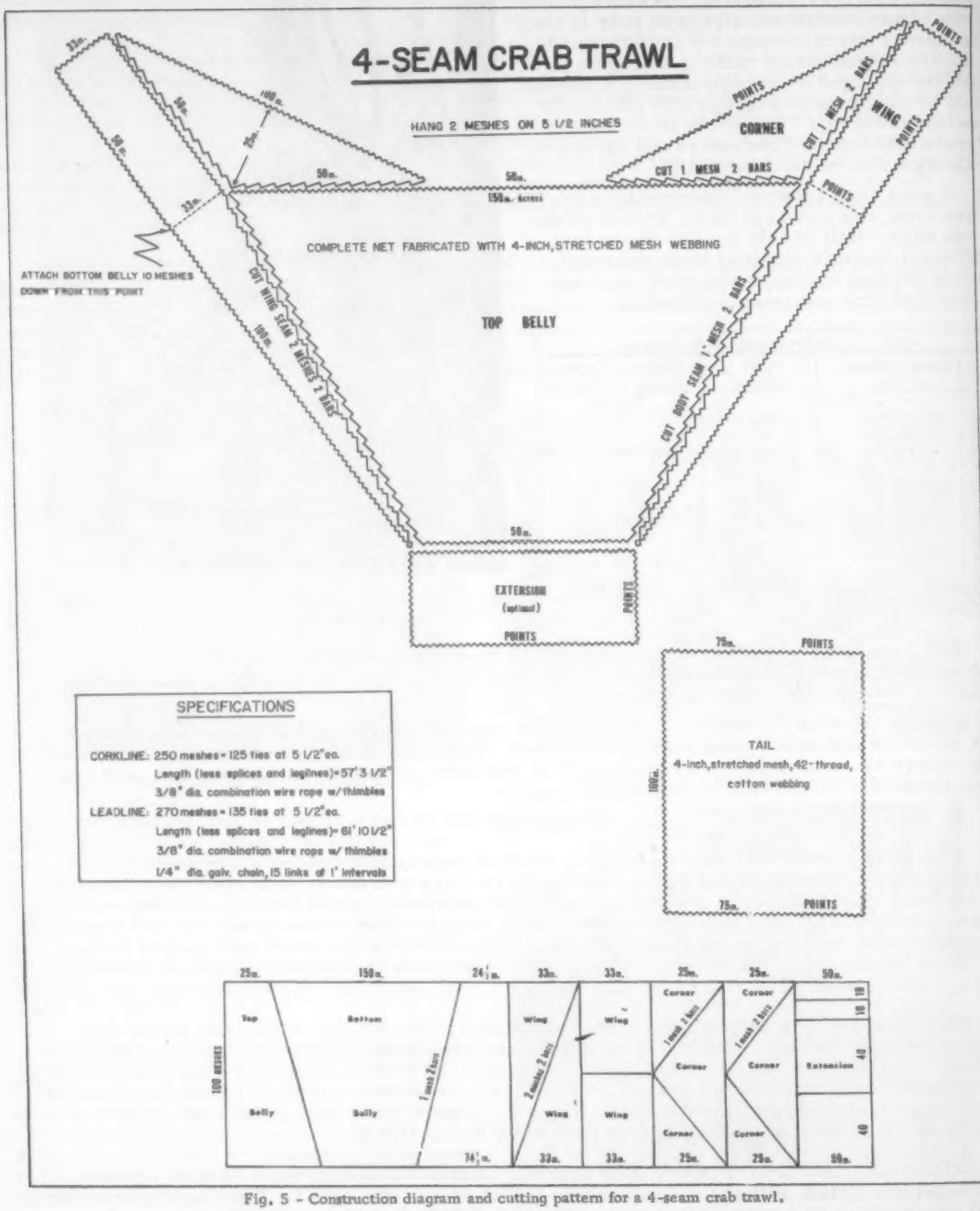

4-SEAM CRAB TRAWL
HANG 2 MESHES ON 5 1/2 INCHES
COMPLETE NET FABRICATED WITH 4-INCH, STRETCHED MESH WEBBING
TOP BELLY
CORNER
WING
POINTS
CUT 1 MESH 2 BARS
CUT WING SEAM 2 MESHES 2 BARS
CUT BODY SEAM 1 MESH 2 BARS
ATTACH BOTTOM BELLY 10 MESHES DOWN FROM THIS POINT
EXTENSION (optional)
TAIL
4-inch, stretched mesh, 42-thread, cotton webbing
SPECIFICATIONS
CORKLINE: 250 meshes = 125 ties at 5 1/2" ea.
Length (less splices and leglines) = 57' 3 1/2"
3/8" dia. combination wire rope w/ thimbles
LEADLINE: 270 meshes = 135 ties at 5 1/2" ea.
Length (less splices and leglines) = 61' 10 1/2"
3/8" dia. combination wire rope w/ thimbles
1/4" dia. galv. chain, 15 links at 1' intervals
Top
Bottom
Belly
Wing
Corner
Extension
100 MESHES

Fig. 5 - Construction diagram and cutting pattern for a 4-seam crab trawl.

Table 2 - Materials Needed for Construction of a 57-Foot 4-Seam Crab Trawl

Trawl Part	Description	Quantity	Unit Price (1961)	Total Price (1961)
			$	$
Webbing:				
Net	Panel, 373 by 100 meshes, 21-thread cotton, 4-inch mesh	44 lbs.	1.60/lb.	70.40
Cod end	Panel, 75 by 100 meshes, 42-thread cotton, 4-inch mesh	15 lbs.	1.90/lb.	28.50
Chafer	Panel, 40 by 100 meshes, 42-thread cotton, 4-inch mesh	9 lbs.	1.90/lb.	17.10
Floatline1/:				
Wire rope	3/8-inch diameter combination rope	72 ft.	.12/ft.	8.74
Thimbles	3/8-inch, galvanized	2 ea.	.14 ea.	.28
Floats	Sponge (synthetic)	7 ea.	.49 ea.	3.43
Brail lines	6-thread fine or cotton equivalent	12 ft.	.02/ft.	.24
Leadline1/:				
Wire rope	3/8-inch diameter combination rope	76 ft.	.12/ft.	9.12
Thimbles	3/8-inch diameter, galvanized	2 ea.	.14 ea.	.28
Chain	1/4-inch diameter, galvanized, proof coil	53 lbs.	.40/lb.	21.20
Accessories:				
Tickler chain	1/4-inch diameter, galvanized, proof coil	45 lbs.	.40/lb.	18.00
Shackles	5/16-inch diameter (for tickler chain)	2 ea.	.65 ea.	1.30
Swivels	5/16-inch diameter (for tickler chain)	2 ea.	1.35 ea.	2.70
Bag rings	2-inch, galvanized	15 ea.	.15 ea.	2.25
Twine	36-thread cotton, for hanging	3 lbs.	1.30/lb.	3.90
Rope yarns	Polyethylene (for chafing gear and tying loop chain)	15 lbs.	.55/lb.	8.25
Preservative	Tar or green-treat (copper naphthenate)	74 lbs.	.20/lb.	14.80
Total				210.49

1/Including 6-foot leglines and splices.

and preferably with a double selvage. The webbing should be laid out and cut as shown in figure 6. Net sections should then be sewn together according to the instructions provided by Bullis (1951). Special attention should be paid to Bullis' discussion of the difference between body seam cuts and corner seam cuts and to his description of techniques for sewing tapered seams.1/

EXTENSION PIECE: Depth of the extension piece used with the 4-seam trawl varies with the individual preferences of the netmaker concerned. Some netmakers prefer to use minimum webbing in the trawl. This they do by matching the top and bottom bellies and cutting off the overlap that results from the drop-back. Others add sufficient meshes to the top belly to compensate for the drop-back. Still others compensate for the drop-back and then add an additional 20 to 50 meshes to both top and bottom bellies to extend them further. There is, at present, no way of properly evaluating these modifications.

TRAWL ACCESSORIES: Two important accessories are added to the basic net; the first increases the effectiveness of the trawl, and the second prolongs its life. These accessories are the tickler chain and chafing gear.

Tickler Chain: The tickler chain sets up a disturbance in front of and parallel to the leadline and also acts as a snagline (Scolfield 1948). Both actions are believed to improve the catch. The tickler generally consists of a piece of $\frac{1}{4}$-inch-diameter chain fastened between the doors from points of attachment at their bottom trailing edges.

Fig. 7 - Cod end of a Georgia crab trawl showing the 4-inch stretched mesh webbing and polyethylene chafing gear.

1/A few net makers prefer nets with rolled seams similar to those described by Knake (1956) for fish trawls. They feel that such seams are stronger and lessen the chance of the cod end becoming separated from the body under strain.

Determination of chain length is related to the size of the trawl mouth, measured from door to door along the floatline or leadline, and to the personal preferences of the user. Three common methods of determining tickler-chain length are: (1) the chain is made equal to the length of the floatline; (2) it is cut 4 to 5 feet shorter than the leadline; or (3) it is made equal to one-half the combined length of the floatline and leadline. In all three methods, lengths of the trawl leglines are included in the measurements.

Chafing Gear (fig. 7): Long-lasting polyethylene rope yarns have largely replaced manila rope yarns and strips of automobile inner tubes as chafing gear. The polyethylene yarns are almost 35 percent lighter than manila, are non-absorbent, and are approximately 7 times as resistant to abrasion. Polyethylene gear has one serious disadvantage. Being buoyant, the yarns tend to float up from under the trawl, thereby reducing the amount of protection afforded. Constant attention is necessary to see that the yarns remain properly and firmly secured to the cod end.

LITERATURE CITED

ANDREWS, EMMETT
1947. Crab Pot Construction (Chesapeake Bay Type). U. S. Fish and Wildlife Service, Fishery Leaflet 262 (September), 4 pp.

BULLIS, HARVEY R., Jr.
1951. Gulf of Mexico Shrimp Trawl Designs. U. S. Fish and Wildlife Service, Fishery Leaflet 394 (September), 16 pp.

CARGO, D. G.
1954. Maryland Commercial Fishing Gears. Part 3. The Crab Gears. Educational Series No. 36, Board of Natural Resources, State of Maryland, Department of Research and Education (April), 18 pp.

JUHL, ROLF
1961. A Study of Vessel and Gear Usage in the Shrimp Fishery of the Southeastern United States. Commercial Fisheries Review, vol. 23, no. 8 (August), pp. 1-8. (Also Separate No. 624.)

KNAKE, BORIS O.
1956. Assembly Methods for Otter Trawl Nets. U. S. Fish and Wildlife Service, Fishery Leaflet 437 (December), 29 pp.

KNAKE, BORIS O.; MURDOCK, JAMES F.; and CATING, JAMES P.
1958. Double-Rig Shrimp Trawling in the Gulf of Mexico. U. S. Fish and Wildlife Service, Fishery Leaflet 470 (September), 11 pp.

POWER, E. A.
1961. Fishery Statistics of the United States, 1959, U. S. Fish and Wildlife Service, Statistical Digest 51, 457 pp.

SUNDSTROM, GUSTAF T.
1957. Commercial Fishing Vessels and Gear. U. S. Fish and Wildlife Service, Circular 48, 48 pp.

SCOLFIELD, W. L.
1948. Trawling Gear in California. State of California, Division of Fish and Game, Fishery Bulletin No. 72, 63 pp.

WHARTON, JAMES
1954. The Chesapeake Bay Crab Industry. U. S. Fish and Wildlife Service, Fishery Leaflet 358 (Revised), (September), 17 pp.

CURED FISH FIRST MANUFACTURE ON NORTH AMERICAN PACIFIC COAST

"Cured fish of various types were the first manufactured products prepared on the Pacific coast. The Indians had a considerable dried-salmon industry at The Dalles, on the Columbia River, long before the coming of the white man. The fish were traded to the plains tribes of the interior. . . . The Russians operated a commercial salt-salmon industry in Alaska at the beginning of the 19th century. Salt salmon was shipped as far as St. Petersburg. Soon afterward the Northwest Fur Company started a salmon-salting business on the Columbia River. The Northwest Company merged with the Hudson's Bay Company which shipped salt salmon to Hawaii, Australia, China, Japan, and the eastern United States. American fishermen salted salmon in Alaska while it was still a Russian possession. A number of the large salmon canneries of today were originally established as salmon salteries."

--Principles and Methods in the Canning of Fishery Products, Research Report No. 18 (page 5), U. S. Fish and Wildlife Service.

COMPARISON OF pH, TRIMETHYLAMINE CONTENT, AND PICRIC ACID TURBIDITY AS INDICES OF ICED SHRIMP QUALITY

By Sammie Bethea* and Mary E. Ambrose**

ABSTRACT

As possible indices of quality during iced storage, a study was made of the changes in pH and trimethylamine nitrogen content of raw headless brown shrimp. Results were compared with those obtained from picric acid turbidity tests conducted simultaneously on the same shrimp and previously reported. The quality ratings of the shrimp as determined by a taste panel were used as standards for all tests. Changes in color and viscosity of shrimp homogenates were also observed for possible use as accessory tests of quality.

The data show that definite pH values could be assigned for different quality evaluations of brown shrimp from a certain production area, and thus could furnish an objective quality index. Trimethylamine nitrogen values were of use in assessing quality, but only after prime quality had disappeared and off-flavors had become apparent to the taste panel. The picric acid turbidity test gave indications of loss of quality several days before the taste panel could detect any off-flavors. A change in the color of the homogenates from pink to brown and an increase in viscosity accompanied the decrease in quality.

INTRODUCTION

Many objective tests for shrimp quality have been investigated, but none has been in itself completely satisfactory for evaluating the deterioration of quality from prime condition to spoiled. Bailey, Fieger, and Novak (1956) outlined three groups of tests on ice-stored shrimp that indicate (1) changes in prime quality, (2) the onset of spoilage, and (3) changes in relative quality. Of the tests included in the third group, change in pH is the simplest to apply and indicates loss of prime quality and spoilage at definite pH readings. Determinations of trimethylamine nitrogen content is one of the tests used to indicate the onset of spoilage, although it gives no information of prespoilage changes (Fieger and Friloux 1954).

A new test for evaluating shrimp quality, known as the picric acid turbidity test, has been developed and tested at this Laboratory by Kurtzman and Snyder (1960). This test indicates, by increasing turbidity, loss of good quality of iced shrimp as measured by a taste panel, although the mechanisms involved are not thoroughly understood. The objectives of the work reported in this paper were therefore as follows: (1) to conduct the conventional tests of pH and trimethylamine nitrogen determinations in conjunction with the picric acid turbidity test to determine whether either the pH or the trimethylamine nitrogen content of the shrimp was possibly a contributing factor to the formation of turbidity, (2) to determine whether these determinations would be applicable to shrimp held in ice but peeled and deveined before testing, and (3) to determine whether changes in color and viscosity of the shrimp homogenates could possibly be used as accessory tests for quality.

EXPERIMENTAL

SAMPLE: One lot of headless brown shrimp (Penaeus aztecus) that was part of the last net load caught during a normal commercial operation just prior to docking of a fishing vessel at Brownsville, Tex., was used in this study. The shrimp were frozen immediately after being landed and were sent to the laboratory at College Park, Md.

Part of the lot was held at -5° F. to be used for frozen controls. The remainder was thawed at 35° F., then layered in crushed ice and held in a 35° F. cold room. These shrimp were re-iced in fresh ice every other day.

*Former Chemist
**Chemist
Technological Laboratory, Division of Industrial Research, U. S. Bureau of Commercial Fisheries, College Park, Md.

U. S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
SEP. NO. 643

SENSORY TEST: The quality of both the frozen shrimp and the iced shrimp was determined by a taste panel composed of five members. The panel graded the shrimp as high, good, fair, borderline, or inedible (Kurtzman and Snyder, 1960). Numerical values from 5 to 1 were assigned to these categories in the order of decreasing quality (figs. 1 to 3).

PHYSICAL AND CHEMICAL TESTS: Two 50-gram samples were taken daily from the frozen lot of shrimp and thawed, and two were taken from the iced lot. The four samples of shrimp were each peeled, deveined, and homogenized for 1 minute in a mechanical blender with 100 milliliters of demineralized water. Beginning on the 14th day of the experiment, 200 milliliters of water were used for each sample, and on the last two days 400 milliliters were used. These concentration changes were necessary in order to permit pipetting an aliquot of sample because of increased formation of gelatineous material.

The pH of the shrimp homogenates was then determined at room temperature.

The trimethylamine nitrogen content of the shrimp was determined by the method of Dyer (1945) as modified by Hoogland (1956).

The picric acid turbidity test was conducted on samples varying in size from individual shrimp to 100 grams 1/. The test consists of measuring by means of a Klett-Summerson photoelectric spectrophotometer the turbidity of filtrates obtained from slurries of shrimp macerated in 70-percent alcohol with saturated aqueous picric acid added. An increase in turbidity is indicative of loss of quality of the shrimp.

The color and viscosity of the homogenates were observed visually.

RESULTS AND DISCUSSION

ICED SHRIMP: Sensory Test Results: The taste panel considered the freshly-thawed shrimp to be high quality. On the 5th day, the panel still rated the shrimp as good quality. On the 8th and 10th days, the panel rated the shrimp as fair quality, on the 12th day, as borderline quality, and on the 15th day as inedible (figs. 1 to 3).

pH Readings: The pH of homogenates of the fresh shrimp was 7.24, and it increased to 7.80 on the 5th day. By the 8th day, the pH had risen to 8.20, and readings remained between 8.00 and 8.20 during the periods of fair and borderline quality. When spoilage occurred, the pH exceeded 8.20 (fig. 1).

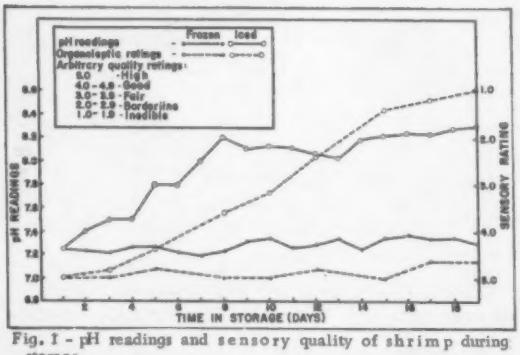


Fig. 1 - pH readings and sensory quality of shrimp during storage.

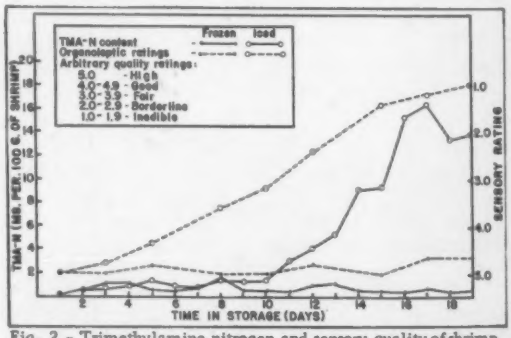


Fig. 2 - Trimethylamine nitrogen and sensory quality of shrimp during storage.

Trimethylamine Nitrogen Content: The trimethylamine nitrogen content remained about 1 milligram per 100 grams of shrimp until the 8th day. It then started to increase, and rose rapidly from the 12th to the 16th day, after which it leveled off (fig. 2).

1/The picric acid turbidity test was conducted simultaneously and independently by Kurtzman and Snyder (1960).

Picric Acid Turbidity Test: The results of the picric acid turbidity test from 50-gram samples are presented in figure 3. All filtrates from the picric acid turbidity test were clear (readings of 30 or less) for the first 6 days of the experiment. On the 7th and 8th days, the filtrates were slightly turbid (readings between 30 and 100), although clear filtrates were obtained on the 9th and 10th days, probably due to chance selection of better quality shrimp. On the 11th day, the filtrates became very turbid (readings over 100), a day before the taste panel rated the shrimp as borderline quality. The filtrates remained very turbid throughout the remainder of the experiment.

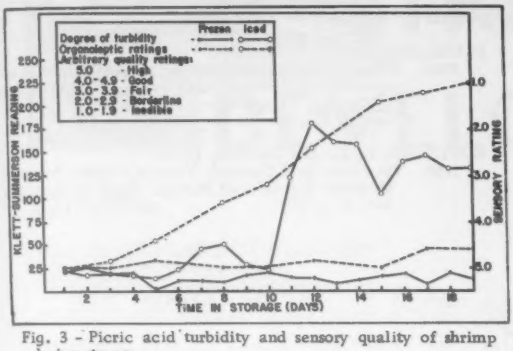


Fig. 3 - Picric acid turbidity and sensory quality of shrimp during storage.

Color and Viscosity of Homogenates: The homogenates of the fresh shrimp were pinkish-white and of low viscosity. By the 6th day, they had changed to light brown and had become more viscous. Depth of color and viscosity continued to increase until on the 13th day they were a brown semisolid mass, and by the 19th day, were a brown, thick, lumpy gel.

FROZEN SHRIMP: During the entire experiment, the taste panel rated the frozen control shrimp as high or good quality, the pH of the homogenates remained within the range of 7.20 and 7.38, the trimethylamine nitrogen content averaged about 1 milligram per 100 grams of shrimp, filtrates of the picric acid turbidity test remained clear (figs. 1 to 3), and the homogenates did not change in color or viscosity.

CONCLUSIONS

The pH of homogenized, peeled, and deveined brown shrimp appeared to be useful as an indication of quality. Since changes in pH were gradual, definite pH ranges could be determined to correspond to quality variations as determined by a taste panel, especially during the first 8 days of iced storage.

Increases in trimethylamine nitrogen content of the shrimp did not become measurable until the pH and sensory values indicated a change from good to fair quality, and thus were of little value for the determination of changes in prime quality.

The picric acid turbidity test indicated chemical changes in the shrimp several days before the taste panel detected an appreciable quality difference.

The occurrence of high turbidity readings for the picric acid turbidity test filtrates coincided with the beginning of measurable increases of trimethylamine nitrogen content of the shrimp. It is therefore possible that trimethylamine nitrogen is a contributing factor to the formation of turbidity. The changes in pH progressed gradually with loss of quality of the shrimp, with no acceleration in the rate of change at the time the picric acid turbidities changed most rapidly. Because of the relatively high acidity of picric acid added to the slurry in the picric acid turbidity test, the contribution of pH of the shrimp to that of the filtrates is apparently negligible. It is quite possible, however, that the changes in pH occurring in the shrimp are essential to the formation of the substance(s) causing the turbidity.

The changes in pH and trimethylamine nitrogen content for peeled and deveined brown shrimp were of about the same magnitude as those reported in the literature for homogenates of shrimp in the shell. However, the leveling off of the trimethylamine nitrogen content after the 16th day may have been due to the removal of the shells and sand veins, and/or the removal of some of the decomposition products with the changing of the ice every other day.

Changes in color and viscosity of the shrimp homogenates were useful accessory tests of quality.

LITERATURE CITED

BAILEY, M. E.; FIEGER, E. A.; and NOVAK, A. F.
1956. Objective Tests Applicable to Quality Studies of Ice-Stored Shrimp. Food Research, vol. 21, pp. 611-620.

DYER, W. J.
1945. Amines in Fish Muscles. I - Colorimetric Determinations of Trimethylamine as a Picrate Salt. Journal Fisheries Research Board of Canada, vol. 6, pp. 351-358.

FIEGER, E. A. and FRILOUX, J. J.
1954. A Comparison of Objective Tests for Quality of Gulf Shrimp. Food Technology, vol. 8, pp. 35-38.

HOOGLAND, P. L.
1956. A Convenient Arrangement for the Determination of Trimethylamine in Fillets. Fisheries Research Board of Canada, Technological Station, Halifax, Nova Scotia, Circular No. 3.

KURTZMAN, C. H. and SNYDER, D. G.
1960. The Picric Acid Turbidity Test--A Possible Practical Freshness Test for Iced Shrimp. Food Technology, vol. 3, p. 337.

CLAM AND CHEESE DIP

1 can (7 ounces) minced clams
2 packages (3 ounces each) cream cheese
2 teaspoons grated onion
2 teaspoons lemon juice
1 teaspoon chopped parsley
¼ teaspoon salt
3 drops tabasco
Canned whole cranberries
1 teaspoon Worcestershire sauce

Drain clams and save liquor. Soften cheese at room temperature. Combine all ingredients except cranberries and liquor; blend into a paste. Gradually add about ¼ cup clam liquor and beat until consistency of whipped cream. Chill. Serve in a bowl. Garnish with cranberries. Makes about 1 pint of dip.

California

PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 61A9-Pelagic Fish: The coastal waters of California from Point Reyes to Santa Cruz Island were studied November 27-December 14, 1961, by the California Department of Fish and Game research vessel Alaska (1) to determine the amount of sardine recruitment from the 1961 spawning and to measure the population density of older sardines; (2) to sample Pacific mackerel, jack mackerel, and anchovies for age and distribution studies; and (3) to collect live sardines from Monterey Bay, and elsewhere north of Point Conception for blood genetic studies.

A total of 62 stations were occupied. Anchovies, 44 to 119 mm. long, were taken at five stations. No sardines, jack mackerel, or Pacific mackerel were taken or observed.

The Alaska scouted 479 miles between stations. Fish schools were very scarce throughout the area; only 8 anchovy schools were observed near Purisima Point. "Pinhead" anchovies were scattered at the surface between stations in the northeast end of Monterey Bay.

Generally poor weather hampered operations during most of the cruise. High winds and rough seas kept the Alaska in port for 4 nights and curtailed operations on 2 other nights. In addition, marginal weather conditions on most of the remaining nights limited the areas which could be worked. Sea-surface temperatures ranged from 51.31° F. at Point Buchon to 56.48° F. at El Capitan.

This cruise, together with cruises 61A5 through 61A8, formed the 1961 pelagic fish survey in California and Baja California. These cruises indicated that adult (age 1 and over) sardines were much less abundant than in 1959 and 1960. The percentage of stations where adult sardines were taken dropped to about one-fifth of the percentage recorded in 1959 and 1960. The abundance and distribution of sardines of the 1961 year-class was about the same as that of the relatively weak 1960 year-class last year. Fish-of-the-year have been virtually absent from California waters during the last two years.

Anchovies and Pacific mackerel had about the same abundance in all areas as in 1960, while jack mackerel were less abundant.

Airplane Spotting Flight 61-14-Pelagic Fish: The inshore area from the United States-Mexican Border to Monterey Bay, Calif., was surveyed from the air (November 13-16, 1961) by the Department's Cessna "182" 9042T to determine the distribution and abundance of pelagic fish schools.

No coverage was possible north of Monterey Bay because of a persistent low cloud cover. Conditions were generally favorable south of Monterey Bay.

Only 25 schools, all anchovy, were seen during the flight. Eleven were close to the beach near Scripps pier, La Jolla; 5 were near the Oceanside pier; and 9 were scattered between Avila and Pismo Beach.

Airplane Spotting Flight 61-15-Pelagic Fish: The area from the United States-Mexican Border to Point Piedras Blancas, Calif., was further studied from the air (December 1-4, 1961) by the Cessna "182" 9042T to determine the distribution and abundance of pelagic fish schools. The weather was good throughout the area covered.

Only three small schools of anchovies (off the Coronado Strand) were seen south of Port Hueneme and no fish were spotted north of Ventura. A fairly large school group of anchovies was between Ventura and Port Hueneme. Despite very dirty water, resulting from the recent rains, 189 schools were

counted, all within one mile of shore. Good commercial catches of sardines were made in the same area two days before the flight, but no sardine schools were identified.

Airplane Spotting Flight 61-16-Pelagic Fish: The inshore area from Port Hueneme to San Diego and the offshore islands of southern California was surveyed from the air by the Department's Twin Beechcraft N5614D on December 13, 1961, to determine the distribution and abundance of pelagic fish schools.

Fair flying weather prevailed over most of the area; however, low coastal clouds prevented inshore spotting between Point San Mateo and San Diego. The sea was generally calm but there was considerable surface glitter.

Anchovies were abundant from Port Hueneme to Point Dume. Fifty-nine schools, including an unusually long one, were in this area. Several large schools were observed splitting up into small schools and then reuniting. The long anchovy school, off Point Dume, was approximately $1\frac{1}{4}$ miles long by 20 to 30 feet wide.

Only one sardine school, a large one, was observed. It was between Redondo Canyon and Malaga Cove in the southern end of Santa Monica Bay.

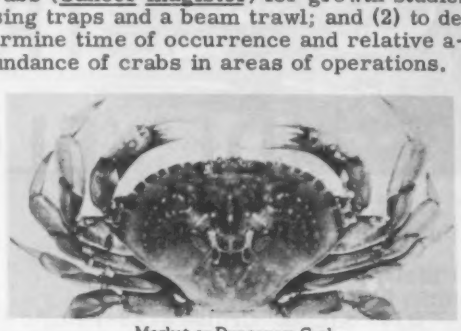
Off San Mateo Point about 100 porpoises, specific identity unknown, were observed in a closely-knit group.

About 150 Pacific pilot whales (Globicephala scammoni) were seen $1\frac{1}{2}$ to 2 miles offshore between Catalina Harbor and the east end of Santa Catalina Island. They were in pods of 15 to 20 animals. Sixteen pilot whales were noted between Santa Catalina Island and Palos Verdes Point. They were widely separated and apparently feeding. Only one gray whale was seen; it was in Kuyler's Cove, San Miguel Island.

Note: See Commercial Fisheries Review, Feb. 1962 pp. 14-15.

* * * * *

DUNGENESS CRAB STUDIES CONTINUED: M/V "Nautilus" Cruise 61N19a-d-Crab: The coastal waters off central California from Bodega Bay to San Francisco were surveyed (Aug. 15-20, Sept. 12-17, Oct. 17-22, Nov. 14-19, 1961) by the California Department of Fish and Game research vessel Nautilus (1) to collect market or dungeness crabs (Cancer magister) for growth studies using traps and a beam trawl; and (2) to determine time of occurrence and relative abundance of crabs in areas of operations.



Market or Dungeness Crab
(Cancer magister)

Collections were made at selected stations from Bodega Head to San Francisco using a 10-foot beam trawl with a 1-inch mesh net and seven 30-inch diameter crab traps of 1-inch mesh. The crab traps were baited with rockfish carcasses and squid and allowed to fish overnight. Beam trawling was done at each trap site. Each drag was usually for 20 minutes and covered $\frac{3}{4}$ mile. Exploratory beam trawling also was done at stations where traps were not set.

Excellent samples of juvenile market crabs were obtained from Bodega Bay using the 10-foot beam trawl.

In the Bodega Bay area, the crabs grew 16.6 mm. between August and November; males and females grew at approximately the same rate. In the San Francisco area, crabs grew 13.2 mm. during the same period with males growing slightly faster than females. Sex ratios were approximately equal.

Estimates were made of the number of juvenile crabs in the nursery area at Bodega Bay. In August there were approximately 6.5 million crabs in an area 1 by 3.5 miles. September estimates were much higher, indicating 27.2 million crabs in the area. An extreme concentration of crabs in one part of the bay caused the estimate to be high; in a single 20-minute trawl-haul 56,000 juvenile crabs were taken. No sampling was done in October, and in November only 0.8 million juvenile crabs were in the area. It is felt this reduction in the population was due to movements out of the nursery area.

Adult crabs were also taken in both the trawl and the traps; however, no increase in

the average size of the adult group was noted during the period. The extreme range in size of any age group has made it impossible to identify succeeding year-classes; however, with the abundance of juveniles it is hoped that their growth into the next year of life and possibly into the harvest will be followed.

Note: See Commercial Fisheries Review, Feb. 1962 p. 12-13.

* * * * *

ROCKFISH TAGGING STUDIES CONTINUED:

M/V "N. B. Scofield" Cruise 61S8-Rockfish: The California Department of Fish and Game research vessel N. B. Scofield cruised (Nov. 24-Dec. 4, 1961) in the area of Santa Cruz, Santa Rosa, San Miguel, and Santa Barbara Islands to (1) capture blue rockfish, Sebastodes mystinus, by hook and line for tagging and for food and age studies; and (2) collect other species of rockfish for taxonomic studies.

Blue Rockfish (Sebastodes mystinus)

In all, 507 blue rockfish were tagged; most required deflation of the air bladder and a few had to have their stomachs pushed back into normal position after they were everted by the expanded air bladder. All fish were anesthetized in a 1:15,000 solution of MS 222.

Blue rockfish were caught in depths ranging from a few feet below the surface to almost 150 feet. The largest concentrations were around San Miguel Island where olive, vermilion, and copper rockfish were also quite abundant.

Thirty-four stomach and scale samples were obtained from the blue rockfish and 5 stomach samples were collected from lingcod, Ophiodon elongatus. In addition, several otoliths and partially digested small fish taken from the stomachs of the various rockfish were preserved for identification.

Copper rockfish, S. caurinus, vermilion rockfish, S. miniatus, black-and-yellow rockfish, S. chrysomelas, and juvenile olive rockfish, S. serranoides, were saved for taxonomic studies.

Olive Rockfish (Sebastodes serranoides)

Eight rockfish--rosy, S. rosaceus (2), speckled, S. ovalis (2), widow, S. entomelus (1), vermilion (1), copper (1), and black-and-yellow (1)--were successfully decompressed; these along with a sculpin, Scorpaena guttata, two sarcastic fringeheads, Neoclinus blanchardi, and one petrale sole, Eopsetta jordani, were kept in a live tank and delivered to Marineland of the Pacific.

Other species caught on hook and line included cabezon (Scorpaenichthys marmoratus), ocean whitefish (Caulolatilus princeps), kelp bass (Paralabrax clathratus), California sheepshead (Pimelometopon pulchrum), Pacific sanddab (Citharichthys sordidus), gopher rockfish (Sebastodes carnatus), flag rockfish (S. rubrivinctus), kelp rockfish (S. atrovirens), yellowtail rockfish (S. flavidus), honeycomb rockfish (S. umbrosus), starry rockfish (S. constellatus), bocaccio (S. paucispinis), and squarespot rockfish (S. hopkinsi).

Note: See Commercial Fisheries Review, Jan. 1962 p. 15.

Cans

SHIPMENTS FOR FISHERY PRODUCTS, JANUARY-NOVEMBER 1961:

Total shipments of metal cans during January-November 1961 amounted to 116,567 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 115,108 tons in the same period of 1960. Canning of fishery products in January-November 1961 was confined largely to tuna, jack mackerel, Pacific salmon, and Maine sardines. Although the packs of Maine and California sardines, and shrimp were

down, greater packs of tuna and salmon more than offset those declines.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.

* * * * *

ALUMINUM-ALLOY CANS:

A new method of producing thin, high-strength, lacquered aluminum-alloy sheets is said to make the material economically competitive with tinplate. It offers a considerable advantage over pure aluminum, which would be used more extensively for the manufacture of cans and boxes if its tensile strength were higher.

The process, developed by an aluminum company of Singen, Germany, consists of annealing and quenching hot-rolled coils of an aluminum alloy which contains about 1½ percent of both magnesium and silicon. The heat-treated strip is then allowed to age for 3 or 4 days at room temperature, so that its tensile strength is increased, before being cold rolled. A covering of epoxy resin is then applied which renders the material more suitable for deep drawing into cans, as well as offering protection against subsequent chemical attack. Drying and baking of this lacquer coating is carried out for 30 seconds at a temperature of 240°C. (464° F.) and it is reported that this procedure also helps to increase the tensile strength of the material. Source: New Scientist, vol. 9, no. 219 (1961), p. 215.

Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, 1961:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, more fresh and frozen fishery products were purchased by the Military Subsistence Supply Agency in December 1961 than in the same month of 1960. The increase was 10 percent in quantity and 33.3 percent in value. As compared with the previous month, purchases in December 1961 were lower by 20.4 percent in quantity and 14.0 percent in value (table 1).

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, December 1961 with Comparisons

QUANTITY				VALUE			
December		Jan.-Dec.		December		Jan.-Dec.	
1961	1960	1961	1960	1961	1960	1961	1960
(1,000 Lbs.)				($1,000)			
1,876	1,706	23,450	22,917	1,109	832	12,470	11,839

Table 2 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, 1957-61

QUANTITY					VALUE				
1961	1960	1959	1958	1957	1961	1960	1959	1958	1957
(1,000 Lbs.)					($1,000)				
23,450	22,917	22,651	22,511	23,452	12,470	11,839	11,624	12,850	12,080

Total purchases for the year 1961 were up 2.3 percent in quantity and 5.3 percent in value. The greater increase in value was due to generally higher prices for fishery products in 1961 and to a lesser extent because the purchases consisted of higher-priced products. Fresh and frozen fishery products purchases from 1957 through 1961 have stabilized at around 22.5 million to 23.5 million pounds annually and the value of those purchases from $11.6 million to $12.9 million annually (table 2). However, in 1956, purchases went as high as 26.6 million pounds valued at $13.4 million.

The average price paid for fresh and frozen fishery products in 1961 of 53.2 cents a pound was significantly higher than the 51.7 cents per pound paid in 1960 and the 51.3 cents a pound paid in 1959.

Canned: As occurred in December 1960, the only product purchased in December 1961 was canned tuna but the amount purchased was almost twice as much as in the same month a year earlier (table 3).

Table 3 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, December 1961 with Comparisons

Product	QUANTITY				VALUE			
	December		Jan.-Dec.		December		Jan.-Dec.	
	1961	1960	1961	1960	1961	1960	1961	1960
	(1,000 Lbs.)				($1,000)			
Tuna	423	47	7,081	3,610	235	24	3,315	1,613
Salmon	-	-	1,403	3,593	-	-	893	2,436
Sardine	-	21	131	147	-	9	63	61

Total purchases of canned fishery products in the year 1961 were 17.2 percent greater in quantity but only 2.6 percent higher in value than in 1960 (table 4). The smaller increase in value in 1961 was due to a 61-percent drop in canned salmon purchases. The quantity of tuna purchased in 1961 was 96.1 percent greater than the previous year, but canned sardine purchases were down 10.9 percent because the 1961 pack of canned Maine sardines was substantially less than in 1960.

Table 4 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, 1957-61

Product	QUANTITY					VALUE 1/		
	1961	1960	1959	1958	1957	1961	1960	1959
	(1,000 Lbs.)					($1,000)		
Tuna	7,081	3,610	3,698	5,884	2,711	3,315	1,613	1,672
Salmon	1,403	3,593	1,085	3,336	3,111	893	2,436	737
Sardine	131	147	1,051	253	215	63	61	177
Total	8,615	7,350	5,834	9,473	6,037	4,271	4,110	2,586

1/Value prior to 1959 not available.

Canned fish purchases have fluctuated rather widely during the past five years from a low of 5.8 million pounds in 1959 to a high of 8.6 million pounds in 1961. The purchases in 1961 have been the highest for the six-year period of 1956-1961.

Note: (1) Armed Forces installations generally make some local purchases not included in the data given; the actual total purchases are higher than reported above.
(2) See Commercial Fisheries Review, April 1961 p. 18.

* * * * *

VETERANS ADMINISTRATION REQUIREMENTS FOR CANNED FISH FROM NEW PACKS:

Early this year the Veterans Administration announced its estimated requirements of various canned food products, including fishery products.

Veterans Administration Requirements for Canned Fish from New Packs

Canned Product	Can Size	Quantity (Dozen Cans)
Salmon, medium red or coho, skin and backbone on or removed	4 lb.	3,000
Salmon, red or sockeye	1 lb.	22,000
Salmon, red or sockeye, dietetic	No. ½	9,000
Sardines	No. 1	5,000
Tuna, light meat, chunk, in veg. oil	4 lb.	6,500
Tuna, dietetic	No. ½	9,100

Items listed are purchased by the Marketing Division for Subsistence, Veterans Administration Supply Depot, P. O. Box 27, Hines, Ill.

Fish Bone Detection

AUTOMATIC BONE DETECTION AND REJECTION SYSTEM FEASIBLE:

It is now possible to design and fabricate a commercial unit capable of detecting potentially harmful or objectionable bones in one-half-inch-thick fish portions. This has been made possible by research supervised and financed by the U. S. Bureau of Commercial Fisheries. The same research also indicates that additional equipment can be fabricated which will be sensitive only to the bone signal as it appears on the oscilloscope. Such sensitized equipment could then be coupled to an automatic reject system, thus resulting in an automatic bone detection and rejection system.

Methods for automatically detecting bones in fishery products under normal production conditions have been under study by the Bureau's Technological Laboratory at Gloucester, Mass., since 1954. The most recent work in the field was conducted at the Barkley & Dexter Laboratories, Inc., of Fitchburg, Mass., under a contract from the Bureau. At that laboratory a model X-ray unit was fabricated to detect bones in fish meat under simulated production conditions. The unit was made from commercially-available electronic components and included an X-ray source, a fluoroscope screen, a revolving plastic turntable-sample holder to simulate fish plant production belt speeds of 12.5 and 25 feet per minute, and an electronic detection unit comprised of photoelectric cells wired to an oscilloscope. In operation, X-ray energy passing through the sample results in an image on the fluoroscopic screen. Changes in energy levels resulting from the presence of bone are relayed from the screen to the oscilloscope by the photo cells and result in distortion of the normal line trace.

The unit satisfactorily detected bones in frozen fish portions passing under the detector at belt speeds of 12.5 to 25 feet per minute. All bones greater than 0.012 inch in diameter, or about as thick as three sheets of typewriter paper, were detected in portions one-half-inch thick. However, the sensitivity of the unit decreased with increasing product thickness. Results in detecting bones in unfrozen fish fillets were not entirely satisfactory because of the smaller density contrast between the meat and bone.

Tests at the Bureau's Gloucester Laboratory have shown that bones less than 0.012

inch in diameter are harmless and not objectionable because they become soft upon cooking. Bones greater than 0.012 inch in diameter are either objectionable or potentially harmful.

Note: See Commercial Fisheries Review, October 1961 p. 14.

Fish Oils

EFFECT OF DIETARY FISH OILS ON BLOOD CHOLESTEROL:

A number of fish oils have been shown to have a cholesterol-depressant effect on hypercholesteremic rats. These include oils from menhaden, tuna, herring, dogfish liver, mullet, perch, and salmon. These and others such as cod-liver oil, sardine oil, and seal oil have been reported to be effective in patients and in experimental animals.

Experiments are being conducted to determine which components of fish oils are active as cholesterol depressants. Comparative analyses are being made on the effects of total unsaturation and of specific types of unsaturation in the tissue lipids of rats. The effects of feeding highly unsaturated products in the distribution of fatty acids in the tissues of both normal and hypercholesteremic rats are also being investigated. Lipids from cardiovascular tissues from rats fed marine oil esters are being fractionated and analyzed for their total fatty acid spectrum. This work is being done under a U. S. Bureau of Commercial Fisheries contract awarded in 1961 to the Hormel Institute, University of Minnesota.

Information on the effects of whole fish products is also important. Consequently, menhaden, silver salmon, ocean perch, and mullet were freeze-dried. The dried products, lipids from the dried products, and dried products with lipids extracted were fed to hypercholesteremic rats.

A paper ("Effect of Dietary Fats and Marine Oil Fractions on Cardiovascular Tissues," by James J. Peifer and W. O. Lundberg) presented at the Federated Societies for Experimental Biology in Atlantic City on April 14, 1961, reveals that previous studies by Peifer et al. established that linolenate, menhaden, and tuna oils are very effective cholesterol-depressant agents. Further studies were made of the effects of feeding butter, margarine, corn oil, and marine oil fractions on tissue lipids of hypercholesteremic rats. Results show that cholesterol-depressant activities of tuna, menhaden, and dogfish-liver oils were due to their fatty acid components while their nonsaponifiables tend to aggravate the hypercholesteremic condition. All supplemental lipids promoted significant changes in higher polyene components of the myocardium and of the phospholipids from plasma and liver. Test lipids had less effect on cholesteryl ester polyenes. Studies suggest each tissue has its own specific polyenoic acid requirements. Polyene concentrates from menhaden oil were most effective in reducing blood cholesterol, the TC-TP ratio in plasma, and liver lipids. Lipid analyses by silicic acid microchromatoplates and GLC will be reported later.

Note: This contract research is supervised by the Technological Laboratory, U. S. Bureau of Commercial Fisheries, Seattle, Wash.

* * * * *

INVESTIGATION OF CHEMICAL COMPOUNDS CAUSING FISHY FLAVORS AND ODORS:

Attempts are being made to determine causes for and precursors 1/ of fishy odors and flavors in marine oils. Low-molecular-weight aldehydes, ketones, acids, and amines are probably among the offenders. Methods have been developed to determine small amounts of these compounds. Derivatives of aldehydes, methyl ketones, and fatty acids containing 1 through 8 carbons were prepared, separated, and identified. This research is being done under a U. S. Bureau of Commercial Fisheries contract awarded in 1961 to the Hormel Institute, University of Minnesota, Austin, Minn.

Compounds containing nitrogen, phosphorus, or sulfur often have potent and obnoxious odors. Elemental analyses were made on odoriferous fractions of fish oil obtained from molecular distillation.

Potential precursors of odoriferous materials are being studied. Classes of compounds include long-chain amines, amides, nitriles, cyanates, thicocyanates, sulfates, sulfonates, phosphates, and phosphonates. Any compounds that were not commercially available were synthesized. Each was mixed with methyl esters of fish oil fatty acids and stored at room temperature. Any that develop fishy flavors and odors during storage will

1/ A precursor is a compound from which another compound is formed.

be analyzed to determine the classes of compounds formed in an attempt to detect chemical changes that have occurred.

Attempts are being made to learn why oxidation of fish oil fatty acids is different from oxidation of those in other oils and results in "fishy" odors.

Studies during the latter part of 1961 were done on the volatile components found in fish oils. Derivatives of carbonyl compounds often cannot be separated by ordinary methods, including paper chromatography. Separations of these were accomplished by gas chromatography. Derivatives were prepared and chromatographed on paper.

Since nitrogen compounds may contribute to odors of fish oils, fractions obtained from molecular distillations of commercial oils were tested for the presence of primary, secondary, and tertiary amines.

Column chromatography was used to fractionate fish oil. This was an attempt to segregate odors characteristic of the total oil and to determine whether the odors would be associated with some particular classes of lipids. A total of 24 fractions were separated, the odors described, and the classes of lipids present in the fractions are being characterized.

Note: This contract research is supervised by the Technological Laboratory, U. S. Bureau of Commercial Fisheries, Seattle, Wash.

* * * * *

APPLIED RESEARCH ON EFFECT OF COMPONENTS ON HEALING OF SKIN LESIONS:

For years many people have believed that fish oils promoted healing of skin lesions and had a benefical effect on the skin. Fish oils are added to a number of pharmaceutical and cosmetic products on the market, including creams, ointments, and sprays for burns. But information is not available in the scientific literature about the nature of or the use of fish oils in this field. Questions have been raised about the effects of tryglycerides, α,-glyceryl ethers, vitamins A and D, hydrocarbons, and other compounds present in the unsaponifiable fractions of fish oils.

In order to clarify the effects of fish oils, a contract was awarded by the U. S. Bureau of Commercial Fisheries to the Mayo Association and the Mayo Clinic in 1961 to study the action of certain fish oil compounds on the healing of skin lesions. The research involves producing second-degree ultraviolet burns on the skin of hairless mice and guinea pigs. An experimental oil and a control oil will be used. The experimental consists of bleached distilled tryglycerides from menhaden oil. The control oil consists of mineral oil with color and viscosity similar to those of the fish oils. The oils will be applied directly and as a cream. Clinical observations will be made, and if differences are observed in rate of healing or manner of healing, histological studies will be made.

Other components of fish oils such as unsaponifiable fractions and glyceryl ethers will be investigated.

Note: This contract research is supervised by the Technological Laboratory, U. S. Bureau of Commercial Fisheries, Seattle, Wash.

Frozen Fish

MICROWAVE THAWING:

A study of the microwave thawing of frozen fish has been developed by Canadian and U. S. Bureau of Commercial Fisheries Gloucester Technological Laboratory scientists. The Canadians will catch inshore cod and brine-freeze them in pre-rigor and post-rigor conditions. The fish will be shipped to the Gloucester Laboratory where they will be thawed by a microwave unit.

The quality of the thawed fish will be evaluated by the Gloucester Laboratory's taste panel at bimonthly intervals. Aliquots of the bimonthly samples will be returned to the Canadians who will determine free fatty acids and protein dispersibility.

In addition to determining the feasibility of rapid thawing with microwaves, the results of the tests may settle the long-standing dispute between proponents of post-rigor plate freezing and the proponents of pre-rigor brine-freezing.

Gear

LOCATION OF DETACHABLE COD ENDS:

During rough weather, floating fishing gear or detachable cod ends with or without

radar reflectors cannot be seen on the radar screen. Undue delay in locating drifting cod ends deteriorates the quality of the fish.

A small transmitter fixed to the drifting cod end was found very satisfactory in quickly locating the cod ends. In spite of very bad weather during experiments off Greenland, it was possible to detect without any difficulty the drifting transmitter-fitted cod end up to 8 nautical miles away.

Small transmitters are manufactured in suitable designs to locate lifeboats or shipwrecked sailors. Similar transmitters are used for detecting floating whales. Source: Hansa, vol. 97, no. 8-9 (1960), p. 479.

Great Lakes Fishery Investigations

WHITEFISH SPAWNING SURVEY IN APOSTLE ISLANDS AREA OF LAKE SUPERIOR CONTINUED:

M/V "Siscowet" Cruise 10: Activities of the U. S. Bureau of Commercial Fisheries research vessel Siscowet (November 27-December 13, 1961) were in the Apostle Islands region, at localities east of Stockton Island, east of Madeline Island, north of Sand Island, east of Outer Island, east of Basswood Island, and in Presque Isle Bay. The studies dealt primarily with the spawning activities of pygmy whitefish, round whitefish, lake herring, and various forms of chubs. Although rough weather curtailed many of the scheduled activities, substantial amounts of life-history data and materials were collected.

Pygmy whitefish spawned in about 20 fathoms during the last week of November and round whitefish spawned in about 3 fathoms during the first week in December. Fertilized eggs were collected from both species for studies of embryonic and larval development but all of the pygmy whitefish eggs died soon after collection. Fertilized eggs were collected also from lake herring, chubs (Coregonus hoyi and C. kiyi). In addition, eggs of lake herring and chubs (C. hoyi) were cross-fertilized with milt from chubs (C. hoyi) and lake herring, respectively. The eggs will be incubated and the fry reared at the Northville Hatchery, in an attempt to discover characteristics which may aid in field identification of the various forms.

Scanning with the Siscowet's fish magnifier (a modified echo-sounder) confirmed earlier suggestions that lake herring may be pelagic spawners. Night scanning on November 28, 1961, during the peak of the spawning season revealed a heavy concentration of fish (presumably lake herring) at depths of 5 to 15 fathoms, in water 35 fathoms deep. A midwater trawl (converted from a 43-foot semi-balloon bottom trawl) towed 10 fathoms below the surface caught small numbers of lake herring and smelt. A 5-foot, 1/16-inch-mesh net (usually used for the collection of larval fish) which was towed at 20 fathoms, below the concentration of lake herring, caught small numbers of lake herring eggs, and opossum shrimp (Mysis). The eggs undoubtedly were drifting towards the bottom after being released in midwater. Stomachs from the lake herring and smelt caught in the midwater trawl were examined; all of the lake herring stomachs were empty and the smelt contained only mysids.

The concentration of fish, as observed by the fish magnifier, descended to slightly deeper levels during the night and by 10:00 p. m. most fish were at the 10- to 20-fathom depth. Heavy seas prevented further observations but commercial gill nets lifted from the bottom in the same area during the following morning yielded several tons of lake herring. The fish apparently migrated to the bottom sometime during the night, possibly to spawn. Some spawning, however, occurred at midwater levels.

Standard gill-net gangs (1- to 5-inch mesh) were set in three locations among the Apostle Islands. Chubs (Coregonus hoyi) and lake herring were the predominant catches in the East Stockton Island area at 63 fathoms and in the East Outer Island area at 85 fathoms. In the Presque Isle Bay area, catches consisted primarily of smelt at 25 fathoms. Two trawl tows in 20 fathoms east of Basswood Island yielded 27 juvenile lake trout, all of which were fin-clipped.

During the 1961 season the Siscowet captured 536 small (less than 17 inches long) lake trout in the Apostle Islands region. Of the 183 fish which were 2 years old or older, 159 (87 percent) were fin-clipped. Of 353 yearlings, 347 (98 percent) were hatchery-reared fish.

Surface water temperatures during cruise 10 ranged from 42.1° F. east of Stockton Island to 37.0° F. east of Outer Island.

The Siscowet was brought to her winter berth at Bayfield, Wis., immediately after the completion of the cruise.

Note: See Commercial Fisheries Review, Feb. 1962 p. 24.

Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Belle of Texas" Cruise BT-16 and "Miss Angela" Cruise MA-10: Concentrations of brown shrimp were located by the research vessels Belle of Texas and Miss Angela during cruises made during January 19-30, 1962. The concentrations were located by the Miss Angela in the offshore area from Freeport to Port Aransas, Tex., particularly in the 35-60 fathom depth range; and by the Belle of Texas in the offshore areas along the Louisiana coast particularly in the Trinity and Ship Shoal areas. This is the first promising concentrations of shrimp found by the research vessels operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory in Galveston, Tex., since the shrimp distribution studies were expanded in the Gulf of Mexico in September 1961.

The two vessels made a total of 27 tows and covered 9 statistical areas (FWS fishing grid zones 13 through 21). In each area one tow was made in each of three depth ranges--0-20 fathoms, 20-40 fathoms, and 40-60 fathoms. A 45-foot shrimp trawl was used.

The biggest catch occurred in area 19 where 73 pounds of heads-on brown shrimp per three hour tow was caught in the 40-60 fathom range and 19 pounds of shrimp was caught in the 20-40 fathom range. Only a negligible amount was caught in the 0-20 fathom range. The shrimp was all 15-20 count size in the 40-60 fathom range and 21-25 count in the 20-40 fathom range.

Hawaii

SKIPJACK TUNA LANDINGS, JANUARY-DECEMBER 1961:

Landings of skipjack tuna in Hawaii during December 1961 were about 290,000 pounds, or about 55,000 pounds more than in November and 60,000 pounds more than the 1948-60 average landings for the month.

The catch per successful trip of 5,234 pounds in December was twice that of November. There were 36 successful trips by Oahu boats in December as compared with 37 in November.

The landings during December were composed of 32.8 percent small (less than 8 lbs.), 24.8 percent medium (8-15 lbs.), and 42.4 percent large (more than 15 lbs. each) skipjack. This shows an increase in the proportion of large fish and a decrease in medium fish as compared to November.

Total estimated landings for January-December 1961 were 11.4 million pounds, about 1.6 million pounds above the 1948-60 average.

Industrial Products

MAJOR INDICATORS FOR FISH MEAL, SOLUBLES, AND OIL, DECEMBER 31, 1961:

Fish Meal Production and Imports

Item and Period	1961	1960	1959	1958
	.....(Short Tons).....			
Production:				
December.....	12,300	9,185	14,381	14,636
November	10,058	8,725	10,797	9,749
January 2/	2,713	2,433	3,095	2,075
Jan.-Dec. preliminary 3/	287,900	257,969	275,396	226,299
Jan.-Dec. totals 4/...	1/	290,137	306,551	248,140
Imports:				
December.....	1/	15,564	5,538	8,490
November.....	25,649	8,149	3,673	6,082
January	9,531	8,571	19,700	7,696
January-November...	194,214	115,997	127,416	91,862
January-December...	1/	131,561	132,955	100,352

Fish Solubles Production and Imports

Item and Period	1961	1960	1959	1958
	.....(Short Tons).....			
Production 5/:				
December.....	4,600	2,897	5,430	6,305
November.....	5,153	3,542	4,628	8,888
January..	1,129	1,392	1,828	825
Jan.-Dec. totals.....	109,774	98,929	165,359	130,177
Imports:				
December.....	1/	60	420	5,180
November.....	3,849	282	3,089	867
January	219	214	954	473
January-November...	6,267	3,114	26,210	9,396
Jan.-Dec. totals	1/	3,174	28,630	14,567

(Table continued on following page)

Fish Oil Production and Exports				
Item and Period	1961	1960	1959	1958
	.....(1,000 Gallons).....			
Production:				
December.....	1,500	1,038	1,865	1,839
November.....	1,380	1,202	1,147	1,028
January.....	55	46	64	46
Jan.-Dec. preliminary 6/	33,400	26,690	24,418	21,957
Jan.-Dec. totals 7/...	1/	27,886	24,978	22,028
Exports:				
December.....	1/	2,108	2,611	383
November.....	190	1,952	813	2,037
January.....	1,793	276	898	825
Jan.-November	14,934	17,047	16,653	12,156
Jan.-Dec. totals	1/	19,155	19,264	12,539

1/Not available.
2/Does not include crab, shrimp, and misc. meals.
3/Preliminary data computed from monthly data.
4/Final annual data.
5/Includes homogenized fish.
6/Represents over 95 percent of total production. Data computed from preliminary monthly data.
7/Final annual data.
Note: Data for 1961 are preliminary.

* * * * *

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-November 1961: Based on domestic production and imports, the United States supply of fish meal for the first 11 months of 1961 amounted to 470,100 tons--84,100 tons or 22 percent more than in the same period of 1960. Domestic production was 5,500 tons and imports 78,600 tons greater than in the same period of 1960. Peru continued to lead other countries as the principal source of imports with shipments of 132,300 tons during the first 11-months of 1961.

The United States supply of fish solubles, including homogenized fish, during January-November 1961 totaled 111,400 tons--12,300 tons more than in the same period of 1960. Solubles and homogenized fish manufactured from domestically-caught fish made up 94 percent of the supply, while 6 percent of the supply was imported during the first 11 months of 1961.

Fig. 1 - Menhaden purse-seiner vessel at the dock of a reduction plant in Empire, La.

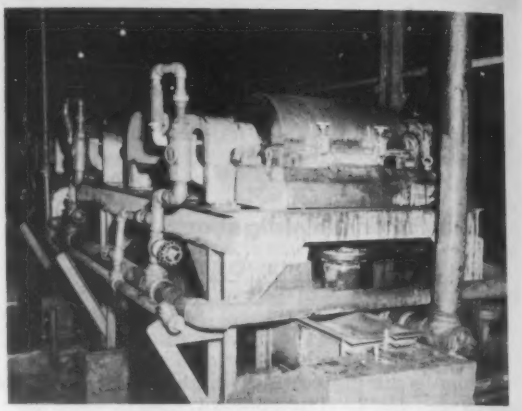


Fig. 2 - At a menhaden plant at Empire, La., a screw press is used to produce press liquor and press cake. From the press cake comes menhaden scrap and meal and from the liquor the oil is extracted as well as the fine solids.

U.S. Supply of Fish Meal and Solubles, January-November 1961 and Comparative Data			
Item	January-November 1961	January-November 1960	Total 1960
	.....	(Short Tons)	.....
Fish Meal and Scrap:			
Domestic Production:			
Menhaden.....	237,286	212,541	218,423
Tuna and mackerel...	19,189	23,963	26,499
Herring, Alaska.....	3,576	6,103	6,102
Other.....	15,504	27,399	39,112
Total production ...	1/275,555	1/270,006	290,137
Imports:			
Canada.....	35,861	29,588	30,982
Peru.....	132,321	58,152	68,156
Chile.....	10,738	17,990	21,183
Angola.....	1,543	360	888
So. Africa Republic...	12,626	6,672	7,073
Other countries.....	1,488	3,235	3,279
Total imports	194,577	115,997	131,561
Available fish meal supply	470,132	386,003	421,698
Fish Solubles:			
Domestic production 2/	105,174	96,032	98,929
Imports:			
Canada.....	935	809	869
Denmark.....	28	1,858	1,858
Other countries.....	5,304	447	447
Total imports	6,267	3,114	3,174
Available fish solubles supply.....	111,441	99,146	102,103

1/Preliminary. Based on reports from firms which accounted for 96 percent of the 1960 total production.
2/50 percent solids. Includes production of homogenized condensed fish.

Maine Sardines

CANNED STOCKS, JANUARY 1, 1962:
Distributors' stocks of Maine sardines totaled only 193,000 actual cases on January 1, 1962, a drop of 40,000 cases or 17 percent from the 233,000 cases on hand on the same date in 1961. Stocks held by distributors on November 1, 1961, amounted to 202,000 cases, and on July 1, 1961, amounted to 208,000 cases, according to estimates made by the U. S. Bureau of Census.

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, January 1, 1962, with Comparisons 1/

Type	Unit	1961/62 Season		1960/61 Season					1959/60 Season			
		1/1/62	11/1/61	7/1/61	6/1/61	4/1/61	1/1/61	11/1/60	7/1/60	6/1/60	4/1/60	1/1/60
Distributors	1,000 actual cases	193	202	208	215	267	233	277	172	197	252	235
Canners	1,000 std. cases 2/	144	221	201	294	506	1,029	1,258	359	235	397	843

1/Table represents marketing season from November 1-October 31.
2/100 3¾-oz. cans equal one standard case.

Canners' stocks on January 1, 1962, totaled only 144,000 standard cases (100 3¾-oz. cans), a drop of 885,000 cases (86 percent) as compared with the same date in 1961. Stocks held by canners on November 1, 1961, totaled 221,000 cases and on July 1, 1961, totaled 201,000 cases.

The low level of current stocks reflects one of the shortest packs of Maine sardines in recent years. The total 1961 pack was 679,169 standard cases as compared with 1,970,000 cases in 1960. The Maine Legislator authorized a 1962 season of 13 months--December 2, 1961-January 1, 1963. The 1960 and 1961 seasons ran from April 15 to December 1, the usual legal season for packing canned sardines in Maine.

The pack of canned Maine sardines for the 1962 season which started on December 2, 1961, totaled 6,927 cases as of February 9, 1962.

The carryover of canned Maine sardines at the canners' level on April 15, 1961, was 457,000 standard cases. Adding the 1961 season (April 15-December 1, 1961) pack of 679,000 cases to the carryover, gives a total supply of 1,132,000 cases as of January 1, 1962. This was slightly less than half the available supply on January 1, 1961, of 2,300,000 cases. Shipments April 15, 1961, to January 1, 1962, amounted to 988,000 cases as compared to 1,271,000 cases for the same period a year earlier. The drop in shipments was due to the smaller amount packed in 1961.

Table 2 - Stocks of Canned Maine Sardines in Warehouses of Retail Multiunit Organizations, January 1, 1960-January 1, 1962

Item	1/1/62	11/1/61	7/1/61	6/1/61	4/1/61	1/1/61	1/1/60
Amount (1,000 actual cases)	56	53	53	56	71	53	52
Percent of total distributors' stocks (%)	29.0	26.2	25.5	26.0	26.6	22.7	22.1

Note: See Commercial Fisheries Review, Jan. 1962 p. 22.

North Carolina

"SEA BED DRIFTERS" RELEASED ALONG NORTH CAROLINA SHORE:
Several hundred "sea bed drifters" were released in mid-January 1962 in the area between Cape Hatteras and Cape Fear, N. C., by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Beaufort, N. C. This was done in cooperation with the Woods Hole Oceanographic Institution, Woods Hole, Mass., and the U. S. Coast Guard Cutter Chiluia, stationed at Morehead City.

Recoveries of the drifters will provide scientists with information on the ocean current pattern along the North Carolina coast. This information will be particularly valuable in studies of the distribution of menhaden eggs and larvae being conducted by the Menhaden Program at the Bureau's Pivers Island Laboratory. Waters along the North Carolina coast are known to be an important spawning ground for menhaden, but the means by which the larvae move, or are carried, from the ocean spawning grounds to the estuarine nursery grounds are not clearly understood. Information obtained from recoveries of the drifters will enable the scientists to follow the dispersal pattern of the young fish in relation to the current pattern.

All persons are urged to be on the lookout for sea bed drifters along the shore. The drifter consists of a 7-inch bright yellow plastic disc attached to a pink plastic stem. A 50-cent reward will be paid by the Woods Hole Oceanographic Institution for the return

of each drifter. A mailing tag attached to the top of the disc should be filled in, placed in an envelope, and mailed to the address shown on the tag.

Oregon

CHINOOK SALMON EGGS PLANTED IN COOS RIVER:

Planting of eggs from late fall-spawning chinook salmon into the South Fork of the Coos River was done by biologists and hatcherymen of the Oregon Fish Commission in January 1962.

There remains in the Coos system a remnant chinook population, but at the time when their spawning activities are conducted, water conditions are usually poor. Establishment of a later-spawning chinook run would take advantage of better water flows and more advantageous temperatures.

Nearly one-million eyed eggs were obtained from the California Department of Fish and Game's Nimbus Hatchery on the Sacramento system. The eggs are from late fall-spawning Sacramento system stock. They were buried in gravel in quantities of 5,000 per man-made redd. This closely approximates the number deposited by a single chinook.

Surplus silver salmon eggs from one of the Fish Commission's hatcheries were sent to California in exchange for the chinook eggs.

Studies have shown the stream flow and spawning gravel on the South Fork are sufficient to maintain runs if they can be established. The egg plants were made to conform as nearly as possible to natural conditions, with hatching estimated to start in about five weeks.

The success of this venture cannot be fully determined until the mature fish originating from the plants return to spawn.

Oysters

SHELLFISH MORTALITY CONFERENCE:

The Fourth Annual Shellfish Mortality Conference was held at Solomons, Md., the week of January 22, 1962. Over 40 biologists and research administrators from marine laboratories along the Atlantic, Pacific, and Gulf coasts considered problems associated with the recognition, study, and control of oyster diseases. A large part of the time was devoted to reports on the epidemic caused by MSX.

A biologist from the Virginia Institute of Marine Service, Gloucester Point, Va., reported to the group that in Virginia the distribution of MSX had changed very little since 1960. No new areas were invaded, but there is no evidence that MSX has disappeared from any area once infested. Early summer infections produce late summer kills (about 40 percent in 1961). Late summer infections result in losses the following June and July.

Another scientific paper described and named the agent which causes a mortality of oysters on Seaside, Va. Previously known as SSO, it has been named Haplosporidium costale. Studied carefully by Virginia scientists during the past three years, this protozoan first appears in live oysters about February. Oysters die from it in May and June and then it disappears until the following early spring.

United States Commercial Fishery Landings, 1961

Of the total United States near-record commercial fishery landings of 5.1 billion pounds, 21 percent (1.1 billion pounds) was taken from the coastal waters between Pascagoula, Miss., and Port Arthur, Tex.--only 300 miles apart as the crow flies.

This confirms conclusively the importance of conserving the environment of the Nation's inshore areas for the control, cultivation, and concentration of fisheries, according to the Fish and Wildlife Service's Bureau of Commercial Fisheries. The effects of altering coastlines, for industrial growth and urban development, must be assessed carefully for the protection of bays, inlets, and estuaries needed for fishery resource development. The items taken from the waters between Pascagoula and Port Arthur consisted largely of menhaden, unclassified fish for animal food, crabs, oysters, and shrimp.

Statistics compiled by the Bureau for 1961 reveal that the United States landings of fish, shellfish, and other aquatic products had an ex-vessel value of about $364 million--about 200 million pounds and $10 million more than in 1960 and only two percent under the record 5.3 billion pounds taken in 1956.

Increased landings of menhaden, tuna, jack mackerel, salmon, and king crabs accounted primarily for the increase in 1961. The record catch of menhaden was 45 percent of the total United States fishery landings; packers of

United States Commercial Fishery Landings of Certain Species, 1961 and 1960

Species	1961 1/	1960
	.....(1,000 Lbs.).....	
Anchovies, California	7,400	5,059
Cod, Atlantic:		
Maine	2,100	2,897
Massachusetts	36,200	31,266
Other	5,400	6,218
Total cod	43,700	40,381
Crabs, all species	220,500	221,681
Haddock:		
Maine	2,600	3,834
Massachusetts	130,600	114,643
Other	100	220
Total haddock	133,300	118,697
Halibut 2/:		
Alaska	25,100	21,351
Washington	14,900	16,802
Total halibut	40,000	38,153
Herring:		
Alaska	48,600	77,913
Maine	51,500	152,327
Industrial fish, Me. & Mass. 3/	41,900	43,798
Mackerel:		
Jack	98,300	74,945
Pacific	40,200	36,810
Menhaden	2,295,900	2,018,263
Ocean perch, Atlantic	134,200	141,433
Oysters, all species	57,800	60,010
Salmon:		
Alaska	263,700	207,100
Washington	29,400	16,528
Other	15,500	11,819
Total salmon	308,600	235,447
Sardines, Pacific	40,100	57,533
Scallops, sea (meats)	27,400	26,599
Shrimp (heads-on):		
South Atlantic & Gulf	155,000	236,939
Alaska	12,600	7,436
Washington	1,500	1,805
California	2,000	2,028
Other	700	1,244
Total shrimp	171,800	249,452
Squid, California	4,200	2,562
Tuna	333,600	298,203
Whiting:		
Maine	14,100	11,123
Massachusetts	67,700	87,348
Other	16,000	13,131
Total whiting	97,800	111,602
Total all above items	4,196,800	4,010,868
Other 4/	943,200	931,361
Grand total	5,140,000	4,942,229

1/Preliminary.
2/Dressed weight.
3/Excludes menhaden.
4/Includes landings for species not listed.
Note: Finfish generally converted to round weight, crustaceans to weight in the shell, and mollusks reported in meats only.

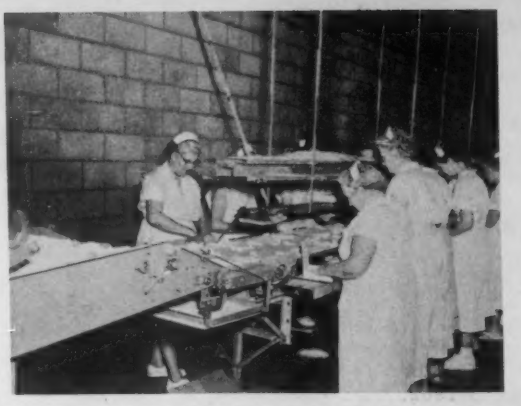


Fig. 1 - Breaded shrimp are hand-packed in cartons prior to freezing in a processing plant in Brunswick, Ga.

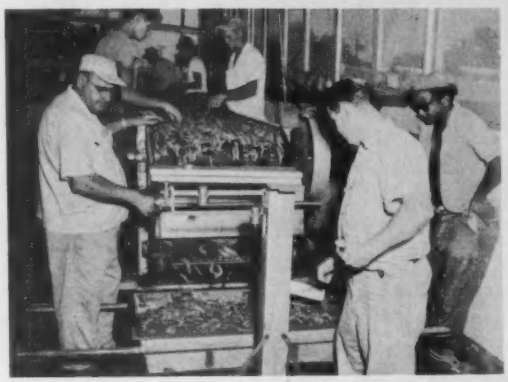


Fig. 2 - Weighing shrimp in a canning plant in Westwego, La. On the scale is a tared weighing bucket. Unsuitable shrimp and marine debris are removed as shrimp travels along the conveyor belt.

canned tuna put up the largest tuna pack in history. The catch of king crabs, sea scallops, and striped bass also hit new highs. Cod, haddock, anchovies, and Pacific mackerel also were taken in considerably greater volume, while large declines occurred in catches of herring (in both Maine and Alaska), sardines, shrimp, and whiting.

Prices for most items advanced during the year and, according to the "Wholesale Prices and Indexes for Edible Fishery Products," prices were 7.8 percent higher in December 1961 than in December 1960.

During 1961, the domestic catch for human consumption continued static, 17 percent below the 1948-1953 average. It was exceeded in quantity by that taken for industrial products, bait, and animal food. Imports of edible fishery products increased over 100 percent.

Note: See Commercial Fisheries Review, January 1962 p. 32.

U. S. Production of Fish Sticks and Portions, 1961

The United States production of fish portions in 1961 amounted to 60.1 million pounds valued at $21.1 million and the production of fish sticks totaled 69.9 million pounds with a value of $29.6 million. Compared with 1960, fish portions were 10.7 million pounds (22 percent) greater in quantity and $3.5 million (20 percent) greater in value. Fish-stick production was up 4.8 million pounds (7 percent) in quantity and $906,000 (3 percent) in value.

During 1961, 11.2 million pounds of breaded cooked and 46.9 million pounds of breaded raw portions were processed--97 percent of the 1961 total. Unbreaded portions accounted for the remaining 1.9 million pounds or 3 percent.

Table 1 - U.S. Production of Fish Sticks by Months and Type, 1961 1/

Month	Cooked	Uncooked	Total
	(1,000 Lbs.)		
January	5,734	357	6,091
February	6,721	371	7,092
March	6,678	555	7,233
April	5,229	377	5,606
May	4,771	365	5,136
June	4,613	325	4,938
July	3,272	313	3,585
August	6,344	593	6,937
September	4,862	354	5,216
October	5,752	391	6,143
November	5,848	450	6,298
December	5,261	367	5,628
Total quantity 1961	65,085	4,818	69,903
	($1,000)		
Total value 1961	27,844	1,733	29,577
Total value 1960 2/	26,792	1,879	28,671

1/Preliminary.
2/Revised.

Table 2 - U.S. Production of Fish Sticks by Months, 1958-1961

Month	1961 1/	1960 2/	1959	1958
	(1,000 Lbs.)			
January	6,091	5,511	6,277	5,471
February	7,092	6,542	6,352	5,925
March	7,233	7,844	5,604	5,526
April	5,606	4,871	4,717	4,855
May	5,136	3,707	4,407	4,229
June	4,938	4,369	4,583	4,702
July	3,585	3,691	3,790	4,574
August	6,937	5,013	3,879	4,358
September	5,216	5,424	5,353	5,328
October	6,143	6,560	5,842	5,485
November	6,298	6,281	4,831	5,091
December	5,628	5,329	4,743	5,467
Total	69,903	65,142	60,378	61,011

1/Preliminary.
2/Revised.

Table 3 - U.S. Production of Fish Sticks by Areas, 1961 and 1960

Area	1961 1/		1960 2/	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	23	57,269	23	58,259
Inland and Gulf States	7	6,772	8	6,161
Pacific Coast States	10	5,862	8	5,722
Total	40	69,903	39	65,142

1/Preliminary.
2/Revised.

Table 4 - U.S. Production of Fish Portions by Months, 1961 1/

Month	Breaded Cooked	Breaded Uncooked	Total	Unbreaded	Total
	(1,000 Lbs.)				
January	694	3,472	4,166	137	4,303
February	756	3,940	4,696	206	4,902
March	1,322	4,339	5,661	170	5,831
April	798	3,565	4,363	144	4,507
May	848	2,944	3,792	110	3,902
June	552	3,352	3,904	159	4,063
July	730	3,146	3,876	110	3,986
August	609	4,252	4,861	126	4,987
September	1,342	4,262	5,604	165	5,769
October	1,591	4,959	6,550	233	6,783
November	1,000	4,580	5,580	233	5,813
December	1,011	4,052	5,063	152	5,215
Total quantity 1961	11,253	46,863	58,116	1,945	60,061
	($1,000)				
Total value 1961	4,563	15,771	20,334	718	21,052
Total value 1960 2/	3,663	12,949	16,612	905	17,517

1/Preliminary.
2/Revised.

Table 5 - U.S. Production of Fish Portions by Areas, 1961 and 1960

Area	1961 1/		1960 2/	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	26	34,567	24	29,028
Inland and Gulf States	12	24,016	11	19,184
Pacific Coast States	6	1,478	5	1,169
Total	44	60,061	40	49,381

1/Preliminary.
2/Revised.

Table 6 - U.S. Production of Fish Portions by Months, 1958-1961

Month	1961 1/	1960 2/	1959	1958
	(1,000 Lbs.)			
January	4,303	3,632	2,692	1,973
February	4,902	3,502	3,025	1,254
March	5,831	4,706	3,225	1,471
April	4,507	3,492	2,634	2,268
May	3,902	3,253	2,684	1,478
June	4,063	3,995	3,247	1,504
July	3,986	4,088	2,227	2,161
August	4,987	3,558	2,796	1,516
September	5,769	4,631	3,558	1,566
October	6,783	5,275	4,314	2,560
November	5,813	4,790	3,483	1,979
December	5,215	4,459	3,262	2,060
Total	60,061	49,381	37,147	21,790

1/Preliminary.
2/Revised.

The 1961 fish-stick production consisted of 65.1 million pounds cooked fish sticks (93 percent) and 4.8 million pounds (7 percent) raw fish sticks.

The Atlantic Coast States led all areas in the production of both fish portions and fish sticks with 34.6 and 57.2 million pounds, respectively. The inland and Gulf States were next with 24 million pounds of fish portions and 6.8 million pounds of fish sticks. The Pacific Coast States made up the remaining 1.5 million pounds of fish portions and 5.9 million pounds of fish sticks.

U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, DECEMBER 1961:

During December 1961, a total of 20 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 16 in December 1960. The number issued first documents in 1961 was 3 less than in 1960. Also, there were 49 more documents cancelled for fishing vessels in 1961 than in 1960. This means that in 1961 there was a decline in the number of vessels documented for fishing.

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, December 1961 with Comparisons

Area (Home Port)	Dec. 1961	Dec. 1960	Total 1961	Total 1960
	(Number)			
Issued first documents 2/:				
New England	1	2	33	35
Middle Atlantic	1	-	12	18
Chesapeake	6	2	74	78
South Atlantic	4	1	44	47
Gulf	6	5	103	90
Pacific	2	5	149	146
reat Lakes	-	1	12	18
Puerto Rico	-	-	2	-
Total	20	16	429	432
Removed from documentation 3/:				
New England	2	-	20	22
Middle Atlantic	3	3	32	18
Chesapeake	-	3	27	21
South Atlantic	2	2	29	38
Gulf	7	6	103	90
Pacific	7	7	111	87
Great Lakes	-	1	17	13
Puerto Rico	-	-	-	1
Total	21	22	339	290

1/For explanation of footnotes, see table 3.

Table 2 - U. S. Fishing Vessels 1/--Documents Issued and Cancelled, by Tonnage Groups, December 1961

Gross Tonnage	Issued 2/	Cancelled 3/
	(Number)	
5-9	7	6
10-19	5	7
20-29	1	2
30-39	2	1
40-49	-	1
50-59	1	3
60-69	1	-
70-79	2	-
230-239	-	1
810-819	1	-
Total	20	21

1/For explanation of footnotes, see table 3.

Table 3 - Fishing Vessels--Documents Issued, 1938-1961

Year	First Documentation	Redocumentation	Total
	(Number)		
1961	409	20	429
1960	408	24	432
1959	479	34	513
1958	684	29	713
1957	601	18	619
1956	521	17	538
1955	418	23	441
1954	717	28	745
1953	729	25	754
1952	675	20	699
1951	780	28	808
1950	812	29	841
1949	1,002	42	1,044
1948	1,184	38	1,222
1947	1,300	48	1,348
1946	1,085	117	1,202
1945	741	4/	4/
1944	635	4/	4/
1943	358	4/	4/
1942	358	4/	4/
1941	354	4/	4/
1940	320	4/	4/
1939	357	4/	4/
1938	376	4/	4/

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
2/Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft were built: 14 in 1961, 2 in 1960, and 4 prior to 1951. Assigned to areas on the basis of their home ports.
3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.
4/Data not available.
Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

U. S. Foreign Trade

SHRIMP IMPORTS, 1960-61:

United States Shrimp Imports (Fresh, Frozen Canned, and Dried), 1960-61

Country of Origin	1961	1960
	(In 1,000 Lbs.)	
Mexico by Customs District:		
Maine	27	-
Massachusetts	-	52
New York	1	92
Charleston, S. C.	-	23
Florida	468	553
New Orleans	3,943	3,890
Galveston	-	140
Laredo	16,297	19,274
El Paso	2	27
San Diego	2,327	1,599
Arizona	55,797	47,673
Los Angeles	199	227
San Francisco	87	-
Oregon	-	25
Washington	3	4
Duluth	30	-
Michigan	-	5
Total Mexico	79,181	73,584
British Honduras	3	1
Greenland	59	26
Canada	249	332
El Salvador	8,093	6,699
Guatemala	744	259
Honduras	228	362
Nicaragua	803	266
Costa Rica	1,322	460
Panama	9,894	8,423
Trinidad	15	194
Bahamas	4	79
Cuba	-	80
Colombia	1,874	2,173
Venezuela	2,468	344
British Guiana	3,506	3,568
Surinam	447	381
Ecuador	4,684	4,193
Peru	358	256
Chile	538	738
Brazil	40	46
Argentina	20	61
Iceland	69	92
Sweden	15	2
Norway	72	110
Denmark	111	80
United Kingdom	59	-
Netherlands	-	1
France	5	-
West Germany	1	2
Belgium & Luxembourg	1	-
Spain	447	225
Italy	54	-
Turkey	4	-
Iran	1,953	1,226
Israel	-	2
Kuwait	193	147
Saudi Arabia	-	77
India	3,220	2,892
Pakistan	1,685	1,018
Indonesia	-	7
Philippines	6	24
Vietnam	114	97
Thailand	36	40
Korea	171	76
Hong Kong	14	2
Taiwan	-	3
Japan	1,823	2,949
Australia	36	128
New Zealand	12	26
Egypt	1,651	1,668
Grand Total	126,282	113,419

United States imports of all shrimp (fresh frozen, canned, and dried) from all countries for 1961 amounted to 126.3 million pounds as compared with 113.4 million pounds for 1960, an increase of 11.3 percent. Shrimp imports from Mexico for 1961 totaled 79.2 million pounds (up about 7.6 percent) as compared with 73.6 million pounds for 1960.

Some sharp increases and decreases in the United States imports of shrimp occurred from 1960 to 1961. Imports of shrimp from Venezuela increased from 344,000 pounds in 1960 to 2,468,000 pounds in 1961 (up 617.4 percent). Costa Rica increased its exports of shrimp to the United States by 187.4 percent in 1961 as compared with 1960, or from 460,000 pounds to 1,322,000 pounds; El Salvador's exports jumped 20.8 percent or from 6,699,000 pounds to 8,093,000 pounds; Panama increased its exports 17.5 percent or from 8,423,000 pounds to 9,894,000 pounds; and India's exports increased 11.3 percent or from 2,892,000 pounds to 3,220,000 pounds. On the other hand, shrimp imports from Japan in 1961 of 1,823,000 pounds were down 38.2 percent from the 2,949,000 pounds in 1960; and shrimp imports from Colombia declined 13.8 percent. During 1961 shrimp were imported into the United States from 51 countries as compared with 56 countries in 1960.

Note: (1) Most imported shrimp is frozen, except for some canned shrimp from northern Europe, Japan, and India; small quantities of dried shrimp from Japan and Hong Kong; and a small quantity of fresh shrimp from Mexico.
(2) See Commercial Fisheries Review, April 1961 p. 36.

* * * * *

UNITED STATES EXPORTS AND RE-EXPORTS OF FROZEN SHRIMP TO JAPAN, JANUARY-OCTOBER 1961:

With the increase in the prices of frozen shrimp and the light supplies, shipments to Japan slowed up considerably the latter part of 1961. Of the almost 8.3 million pounds of domestic and foreign fresh and frozen shrimp exported and re-exported from the United States during the first 10 months of 1961, 5.2

U. S. Exports and Re-Exports of Fresh and Frozen Shrimp 1/ to Japan, January-October 1961

Type of Product	July	August	Sept.	Oct.	Jan.-Oct.
			(1,000 Lbs.)		
Domestic	1,211	243	17	190	2,107
Foreign	1,137	254	40	130	3,129
Total	2,348	497	57	320	5,236

1/ Although data appear under the "fresh and frozen shrimp" category, it is believed that all of the exports were frozen shrimp.

million pounds were shipped to Japan. A substantial proportion of the shipments to Japan was made from California. A large percentage of the re-exports consisted of shrimp imported into the United States from Mexico.

Exports and re-exports of shrimp to Japan from California were negligible prior to 1961. But due to a short supply of shrimp in Japan during the first part of 1961 and a strong market, that country purchased substantial quantities of shrimp from the United States. Most of the Japanese purchases consisted of frozen raw headless brown shrimp, 21-25 shrimp to the pound. But some shipments included 26-30 count, 16-20 count, and under 15 count.

Note: See Commercial Fisheries Review, Feb. 1962 p. 45.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which could be imported into the United States during the calendar year 1962 at the 12½-percent rate of duty had not been announced as of early February 1962.

Imports from January 1-February 3, 1962, amounted to 4,526,521 pounds (about 215,500 std. cases), according to data compiled by the Bureau of Customs.

* * * * *

EDIBLE FISHERY PRODUCTS, DECEMBER 1961:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during December 1961 dropped 13.4 percent in quantity and 7.4 percent in value as compared with November 1961. The decline was due primarily to smaller imports of frozen fillets (groundfish and other types), canned tuna in brine, fresh and frozen salmon from Canada, canned sardines in oil and not in oil, canned salmon, canned crab meat, and shrimp.

Compared with the same month in 1960, the imports in December 1961 were up 12.2 percent in quantity and 26.2 percent in value. The increase in value was due to the higher prices for nearly all imported fishery products. The general increase came about because of more imports of all types of frozen fillets, shrimp, scallops, and canned sardines. These increases were offset somewhat by declines in the imports of frozen and canned tuna, and canned salmon. The increase in canned sardines was due to the light supplies in the United States because of substantial drops in the packs of Maine and California sardines in 1961.

U. S. Imports and Exports of Edible Fishery Products, December 1961 with Comparisons

Item	Quantity			Value		
	Dec.		Year	Dec.		Year
	1961	1960	1960	1961	1960	1960
	(Millions of Lbs.)			(Millions of $)		
Imports:						
Fish & Shellfish: Fresh, frozen, & processed 1/	87.4	77.9	1,010.4	31.3	24.8	304.8
Exports:						
Fish & Shellfish: Processed only 1/ (excluding fresh & frozen)	4.6	4.8	48.7	1.3	2.0	19.2

1/ Includes pastes, sauces, clam chowder and juice, and other specialties.

United States exports of processed fish and shellfish in December 1961 were up 19.3 percent in quantity but dropped 31.6 percent in value as compared with November 1961. Compared with the same month in 1960, the exports in December 1961 were down 3.8 percent in quantity and a substantial 35.0 percent in value.

The substantial drop in value reflects the sharp decline in 1961 exports of canned salmon, canned sardines, and canned shrimp. Lack of adequate supplies was principally the reason for the drop.

Wholesale Prices, January 1962

In spite of seasonally severe weather in the North Atlantic fishing grounds, January 1962 landings of fish in New England were the heaviest since 1958. The slight drop (0.4 percent) in wholesale prices from December 1961 to January 1962 as reflected by the wholesale index for edible fishery products was almost entirely because of lower fresh fish prices in New England. The drop in fresh fish prices, however, was offset by higher prices for nearly all processed fishery products represented in the index. Compared to a year earlier, January 1962 wholesale prices for fishery products were 9.2 percent higher, again because of higher prices for frozen and canned products.

With heavier supplies of fresh fish landed in New England ports, the subgroup index for drawn, dressed, or whole finfish dropped 28.6 percent from December 1961 to January 1962 and was 19.1 percent lower than in January 1961. From December to January, prices dropped for fresh drawn haddock at Boston by 28.6 percent and fresh yellow pike at New York City by 11.0 percent, but rose for frozen Western halibut at New York City by 5.2 percent and Lake Superior whitefish at Chicago by 17.5 percent. Stocks of frozen halibut in January this year were substantially lower than a year earlier. Compared to a year ago, January 1962 prices for all products under the drawn finfish subgroup were down except for frozen halibut at New York City (up 24.4 percent) and whitefish at Chicago (up 2.1 percent).

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, January 1962 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1947-49=100)			
			Jan. 1962	Dec. 1961	Jan. 1962	Dec. 1961	Nov. 1961	Jan. 1961
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					143.0	143.6	141.1	130.9
Fresh & Frozen Fishery Products:					157.6	158.9	154.6	146.2
Drawn, Dressed, or Whole Finfish:					156.1	163.8	153.0	162.7
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.10	.14	101.3	141.8	98.5	125.2
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.37	.36	115.5	109.8	108.3	92.8
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.86	.86	193.8	193.8	191.0	202.2
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.74	.63	183.5	156.2	204.6	179.8
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.57	.64	132.5	148.9	111.4	152.4
Processed, Fresh (Fish & Shellfish):					164.8	161.5	158.8	145.9
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.36	.32	122.5	107.2	115.7	132.7
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.94	.92	148.5	144.6	138.3	118.5
Oysters, shucked, standards	Norfolk	gal.	7.88	7.88	194.9	194.9	194.9	185.6
Processed, Frozen (Fish & Shellfish):					134.4	133.7	133.9	116.0
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.39	103.4	100.8	100.8	102.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.33	.33	103.6	103.6	109.9	109.9
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.33	.31	132.9	124.9	120.8	118.8
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.92	.92	141.2	141.2	138.1	107.2
Canned Fishery Products:					122.1	121.9	121.8	109.9
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	28.00	28.00	146.1	146.1	146.1	143.5
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	12.15	12.15	87.6	87.6	87.6	79.3
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	5.15	5.00	120.2	116.7	114.4	91.0
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	12.31	12.31	131.0	131.0	131.0	90.5

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

Wholesale prices of the fresh processed products rose 2.0 percent from December to January. Shucked oyster prices at Norfolk held steady at the same level since November 1961, but prices for fresh haddock fillets were up 14.3 percent and for fresh shrimp were up 2.7 percent during that period. Fresh processed prices were 13.0 percent higher in January 1962 than in the same month a year earlier. During that period, because of substantially light production in the South Atlantic States, fresh shrimp prices at New York City were up 25.3 percent. In that period, oyster prices rose 5 percent because the oyster industry continued to experience very low production. Offsetting those decreases was a 17.7-percent drop in the prices of fresh haddock fillets at Boston because of heavier landings of haddock in January 1962.

Processed frozen fishery products prices this January were all higher than the previous month, with prices for frozen flounder fillets at Boston up 2.6 percent and frozen ocean perch fillets up 6.4 percent, but haddock fillet prices remained steady at the December 1961 level. Prices for this subgroup this January were up 15.9 percent from the same month a year ago. Prices for frozen flounder fillets were up 1.3 percent, ocean perch fillets were up 11.9 percent, and shrimp a substantial 31.7 percent. On the other hand, frozen haddock fillet prices at Boston dropped 5.7 percent because of larger supplies. Shrimp stocks continued to be substantially lower than a year earlier.

Canned fishery products prices from December to January continued to inch upward principally because of a 3.0-percent rise in the prices for California tomato-packed sardines, the pack of which through January 1962 was still considerably behind the light pack of a year ago. Compared to January 1961, canned fishery products prices this January were up 11.1 percent. Prices for canned pink salmon at Seattle were up 1.8 percent, canned tuna at Los Angeles were up 10.5 percent, canned California sardines at Los Angeles were up 32.1 percent, and canned Maine sardines at New York City were up 44.8 percent. Canned Maine sardine supplies were very light and practically exhausted as of January because of the very light pack in 1961.

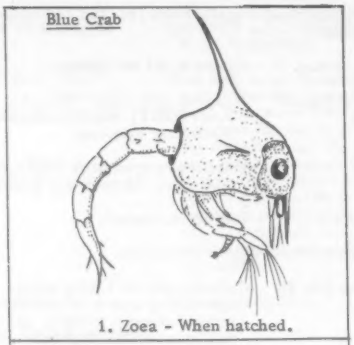
Virginia

SCIENTISTS FORECAST DECLINE IN BLUE CRAB FISHERY:

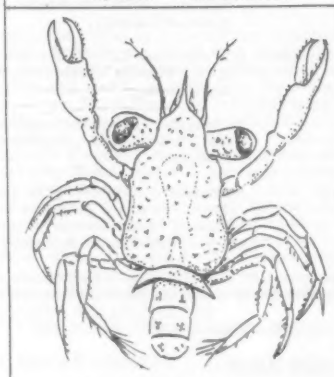
Marine scientists predicted on February 5, that the blue crab catch in Virginia will be much below average for the winter of 1962

Blue Crab

and the spring of 1963. The forecast of a poor catch may be bad news to Virginia watermen and dealers who have seen wide fluctuations in the supply of crabs for over ten years. Since September of 1960, Chesapeake Bay watermen have found the supply of crabs exceeding even the bumper crop of 1950, which had been the largest in the history of this 80-year-old fishery. Now it appears there is little likelihood of a continuance of these good catches into 1963.



1. Zoea - When hatched.



2. Megalops - Second form after molting from the zoeal stage.

Scientists conducting crab research at the Virginia Institute of Marine Science (Virginia Fisheries Laboratory), Gloucester Point, Va., since 1955 have been making predictions of the crab supply a year in advance of the fishery. These predictions are based on extensive studies of recently-hatched crabs and are continually verified as the crabs grow to market size. First estimates are made from experimental York River trawl catches between Pages Rock and Bell Rock.

During the survey from September through November 1961, the number of small crabs was significantly lower than found in any previous year.

However, sometimes crabs spawn in large numbers in the fall. If this happened in the fall of 1961, the sampler would not collect any of the small crabs from that spawning until April of this year. When the spring survey is made, a more favorable forecast may be possible.

Although past predictions have been remarkably accurate, the technique is being improved by studying the relation between tidal currents and the number of small crabs caught. It has been found that samples taken during low slack tide are far below those at other stages of the tide. Predictions based on such samples would be too low.

The scientists plan to conduct similar surveys in the Rappahannock River this summer to make comparisons with York River catches.

The crab fishery between now and September is expected to be below average, for the catch will depend on legal-size crabs remaining in the Bay at the close of the winter dredge fishery plus other crabs which wintered over in the river. From September through November, pot fishermen will find their catch considerably below normal.

FOREIGN

International

NORTHWEST ATLANTIC FISHERIES COMMISSION

POLAND ADHERES TO NORTHWEST ATLANTIC FISHERIES CONVENTION:

The Government of the Polish People's Republic, as of November 21, 1961, has effected her adherence to the International Convention for the Northwest Atlantic Fisheries. (The Convention was dated at Washington, D. C., February 8, 1949, and entered into force July 3. 1950.) The adherence of Poland to the Convention was announced by the U. S. Department of State since the United States is the Depositary Government for the Convention. This adherence makes Poland a member of the International Commission for the Northwest Atlantic Fisheries. Adherence to the Convention was deposited on November 21, 1961.

The Twelfth Annual Meeting of the Commission, as decided by the Commission in its 1961 Annual Meeting and following an invitation by the U. S. S. R. Government, will be held in Moscow June 4-9, 1962. It will be preceded by meetings of various committees and advisers to panels.

Note: See Commercial Fisheries Review, September 1961 p. 61.

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

SOCKEYE AND PINK SALMON FISHERIES REGULATIONS IN CONVENTION WATERS FOR 1962:

The following recommendations for regulations to control the sockeye and pink salmon fishing in Convention waters of the North Pacific for 1962 were issued by the International Pacific Salmon Fisheries Commission on January 25, 1962:

United States Convention Waters:

West of William Head-Angeles Point Line and East of Bonilla-Tatoosh Line:

June 24 to Aug. 5 - Closed to all net fishing.

Aug. 6 to Sept. 9 - Gill nets open daily 7:00 p.m. to 9:00 a.m. (PDST) Monday afternoon to Wednesday morning.

- Purse seines open daily 5:00 a.m. to 9:00 p.m. Monday and Tuesday.

September 9 - Relinquish control.

East of William Head-Angeles Point Line:

June 24 to July 22 - Closed to all net fishing except with nets having a mesh of not less than $8\frac{1}{2}$ inches extension measure and under regulation by the Washington State Director of Fisheries.

July 23 to Sept. 9 - Gill nets open daily 7:00 p.m. to 9:00 a.m. Monday afternoon to Wednesday morning.

- Purse seines and reef nets open 5:00 a.m. to 9:00 p.m. Monday and Tuesday.

September 9 - Relinquish control except in the waters westerly of a line projected from Lilly Point on East Point Roberts true south to the International Boundary.

Waters Westerly of a Line Projected from Lilly Point on East Point Roberts True South to the International Boundary:

Sept. 2 to Sept. 30 - Closed.

Canadian Convention Waters:

West of William Head-Angeles Point Line and East of Bonilla-Tatoosh Line:

June 24 to Aug. 5 - Closed to all net fishing.

Aug. 6 to Sept. 9 - Gill nets open daily 6:00 p.m. to 6:00 a.m. Monday afternoon to Wednesday morning.

- Purse seines open daily 6:00 a.m. to 6:00 p.m. Monday and Tuesday.

September 9 - Relinquish control.

East of William Head-Angeles Point Line Including Areas 17, 18 and that Portion of Area 19 Lying Easterly of the Referenced Line but not District No. I:

June 24 to July 22 - Closed to all net fishing.

July 23 to Aug. 26 - Open to net fishing 8:00 a.m. Monday to 8:00 a.m. Tuesday.

International (Contd.):

Aug. 27 to Sept. 9 - Closed to net fishing in the easterly part of Area 19 specified above.

Aug. 27 to Sept. 30 - Closed to net fishing in Areas 17 and 18.

September 9 - Relinquish control in the easterly part of Area 19 specified above.

September 30 - Relinquish control in Areas 17 and 18.

District No. 1:

June 24 to July 22 - Open 8:00 a.m. Monday to 8:00 a.m. Wednesday.

July 23 to Oct. 7 - Open 8:00 a.m. Monday to 8:00 a.m. Tuesday except that the Area Director of Fisheries may authorize the use of gill nets having a mesh of not less than 9 inches extension measure for linen nets and 9$\frac{1}{2}$ inches extension measure for synthetic fibre nets during any week of this period that a complete emergency closure is required for the protection of sockeye salmon.

October 8 - Relinquish control.

Special Troll Restrictions:

Commercial fishing by hook and line or trolling shall be prohibited during the period from August 12 to October 7, except at such times that net fishing other than with spring salmon nets may be permitted, in any of Canadian Convention waters (Howe Sound not included) lying easterly and inside of a line projected from Gower Point at the northerly entrance to Howe Sound through Thrasher Rock Light thence in a westerly direction to the most northerly point on Valdez Island, thence following the easterly shoreline of Valdez Island to Vernaci Point thence in a straight line to Race Point on Galiano Island, thence following the easterly shoreline of Galiano Island to Mary Anne Point, thence in a straight line to Georgina Point Light on Mayne Island, thence in a straight line towards Point Roberts Light to the intersection with the International Boundary line thence following the International Boundary line to its intersection with the Mainland.

Note: See Commercial Fisheries Review, March 1961 p. 41.

PACIFIC SCIENCE CONGRESS

TENTH CONGRESS RESOLUTIONS INCLUDE SEVERAL ON FISHERIES:

The Tenth Pacific Science Congress convened in Honolulu, Hawaii, August 21-September 6, 1961. Among the resolutions of the Congress, as approved by the Council of the Pacific Science Association and adopted by the Congress, were the following referring to fisheries:

It is generally recognized that the wise use of chemical pesticides is essential and that those developed and put into general use within the past two decades are more practical and more effective than ever before. However, these new pesticides pose threats to man and to desirable plants and animals, including fish and wildlife, especially in large-scale control programs. RESOLVED that in all pest-control operations appropriate safeguards be provided to prevent injury to public health and to desirable plants and animals. All interests should be considered in deciding on when and where control is advisable; what materials, formulations, and methods of application are indicated; and what safeguards are necessary.

The milkfish (Chanos chanos) is an important food fish, cultured intensively in the Philippines, Taiwan, Hong Kong, Indonesia, Vietnam, Thailand, and India; and young Chanos are important bait for tuna long-line fishing. Chanos culture in brackish-water ponds is a well-established industry, expansion of which would greatly increase the production of the protein urgently needed for human nutrition throughout these areas; but expansion is deterred by the fact that the adult fish spawns in unknown areas of the Pacific and Indian Oceans and adjacent seas. Fry for stocking ponds must be collected along coastal shores, where fluctuation in the supply is unpredictable because of lack of information about the biology, migration routes, and spawning areas of the fish in its marine habitat. The Congress is aware of the efforts made by the Indo-Pacific Fisheries Council of the FAO to increase the general knowledge on the culture and biology of the milkfish and that it has compiled through its Chanos subcommittee a comprehensive report on the present status of research on this fish, stressing the inadequacy of present information. RESOLVED that the Congress recommends the establishment and financing--through an international commission or some other means, and in cooperation with the governments concerned and with I.P.F.C. (Indo-Pacific Fisheries Commission)--a research group equipped to study the biology and growth of Chanos in its marine environment from the fry stage to maturity and to locate their exact migration routes and spawning grounds. It is further resolved that copies of this resolution be transmitted to the heads of fisheries departments of all governments concerned and to the FAO and I.P.F.C. and other international agencies and scientific or educational institutions interested in the problem.

The marine turtle populations of the world constitute an important aesthetic and economic resource, which is disappearing, particu-

International (Contd.):

larly in Polynesia, though it could be increased to form an important protein food source, especially for the South China Sea area. RESOLVED that the attention of governments be drawn to the need for increased protection of marine turtles and for sound management programs wherever turtle populations are exploited for food. The Congress especially urges the need for international cooperative research programs to ensure survival and development of this resource in the Pacific Islands and in the South China Sea area.

Reports indicate that native peoples are dynamiting coral beds in Micronesia, New Caledonia, and other areas of the Pacific and are using poisons to take large numbers of fish. Both practices impair or destroy habitat that includes shelter and environment of food sources for the economic and subsistence species and result in dire consequences to the welfare and existence of island populations. RESOLVED that the Congress directs the attention of the Administration of the U.S. Trust Territory of the Pacific Islands, the Territorial Government of Guam, and other responsible agencies and appropriate governments to the prevalence of these abuses and urges that necessary measures be taken and appropriate legislation passed, with subsequent firm enforcement.

INTERNATIONAL NORTHWEST PACIFIC FISHERIES COMMISSION

SOVIET-JAPANESE TECHNICAL TALKS END:

The month-long conference of Soviet and Japnese fishing experts, members of the Science and Technology Committee of the Northwest Pacific Fisheries Commission (Japan-U.S.S.R.), ended in Moscow on December 27, 1961, according to press reports.

The experts discussed the methods of evaluating salmon stocks, the current situation with regard to the stock of these important commercial fish in the northwestern Pacific, and the plans for fishing research for the coming year. The experts of both countries agreed that the salmon stocks, particularly that of its main species, the humpback (pink) salmon, continued to dwindle. Soviet scientists restated their view that this is due mainly to overfishing by Japanese fishermen who take almost two-thirds of the annual catch. The Japanese delegation attributed it to natural causes. The Soviet side has suggested a number of measures to stabilize fishing and to conserve the salmon stock.

The Sixth Annual Meeting of the Commission convened in Moscow on February 26, 1962. (United States Embassy, Moscow, December 29, 1961.)

INTERNATIONAL NORTH PACIFIC FUR SEAL COMMISSION

FIFTH ANNUAL MEETING:

Senior fisheries administrators of four countries met in Ottawa February 7-10, 1962, to plan the future for the fur seals of the North Pacific Ocean which were once threatened with extinction, but are now being maintained at a healthy population level.

Fig. 1 - St. Paul Island of Pribilof Islands, Several fur seal harems at season when the harems are well-knit, before pups start to move out in large numbers.

The occasion is the fifth annual meeting of the International North Pacific Fur Seal Commission, composed of representatives from Canada, Japan, the U.S.S.R., and the United States. The Commission's Scientific Committee met from January 29 to February 6. The Committee reviewed the research program of the Commission and the preparation of a report to be submitted to the regular session of the Commission on February 7-10.

The story of the Commission demonstrates graphically how wise management through international accord has been successful in saving and expanding a valuable, renewable natural resource which might otherwise have become extinct.

The Commission was established under the provisions of the 1957 Interim Convention on

International (Contd.):

Conservation of North Pacific Fur Seals signed at Washington February 9, 1957. The Commission has as its major responsibility the investigation of the fur seal resources of the North Pacific Ocean. The objective of this investigation is to determine the measures which will make possible the maximum sustainable yield from these resources, with due regard for the relation to the productivity of other living marine resources in the area. In accordance with plans developed by the Commission, research agencies of the four participating Governments carry out research at sea. Research and management on the breeding grounds is conducted by the United States on the Pribilof Islands in the Eastern Bering Sea, and by the Soviet Union on the Commander Islands in the Western Bering Sea and on Robben Island in the Sea of Okhotsk.

The main fur seal herds are found on the Pribilofs, a group of five islands north of the Aleutian Archipelago in the Bering Sea. They are named for the Russian navigator Gerasim Pribilof who spent 18 years searching for the breeding grounds of the Alaskan seal herds. His search culminated in the discovery of these grounds on the mist-shrouded islands, of which the two most important areas are St. Paul Island and St. George Island. The island group, with the mainland territory of Alaska, was sold by Russia to the United States in 1867. Breeding grounds for smaller herds are located on the Commander Islands and on Robben Island.

Fig. 2 - Breeding grounds of the northern fur seals: Robben Island (Kaihyōtō or Tyuleniy Island) off Sakhalin; the Commander Islands (Bering Island and Medny or Copper Island) at the Soviet end of the Aleutian chain; and the Pribilof Islands--St. Paul Island, St. George Island, Otter Island, Walrus Island, and Sea Lion Rock.

The early history of the Pribilof seal herds is interspersed with periods of indiscriminate killing and efforts to conserve the seals. The problem of protecting the herds from overexploitation was recognized during the early days of operation and in 1835, when they had dwindled to a dangerously low level, Russia placed a stringent ban on killing. Only males could be taken and females were thus protected. This had the effect of building up the herds which, at the time of the United States takeover of the islands, had been restored to a sizable number.

Under United States jurisdiction the Pribilof seal herds continued to be protected through a ban on killing females and a quota on the number that could be taken on the breeding grounds. However, a new and greater problem was posed in the expansion of pelagic sealing (killing at sea) by fishermen of other nations. This practice was rightly regarded as being both a wasteful and destructive method of taking the animals: wasteful because it resulted in the loss of many seals that were wounded and sank before they could be recovered; destructive because often it involved the killing of pregnant females which resulted not only in the loss of breeding stock but pups as well.

The conviction that proper management of the fur seal herds could only be conducted by a regulated kill of selected groups on the breeding grounds resulted, after an extended period of negotiation, in the signing of the North Pacific Fur Seal Convention in 1911, by Canada, Japan, Russia, and the United States. This convention remained in force until 1941. From 1942 until 1957 the Pribilof herd was protected by a provisional agreement between Canada and the United States.

The current convention, effective for a six-year period, was signed in 1957 with the four original nations participating. One of the main features of this convention is the prohibition it places on the killing of fur seals at sea except for certain specific numbers that may be taken pelagically by scientists of the member countries for research purposes. Also excepted from the pelagic ban are the operations of aborigines using primitive weapons.

In other respects, as well, the terms of the 1957 convention parallel those of the original treaty. They include a provision whereby Canada and Japan each receive 15

International (Contd.):

percent of the seal skins taken by the United States commercial operation on the Pribilofs and, subject to certain stipulations, a similar percentage of the U.S.S.R.'s commercial take on Commander and Robben Islands.

The effectiveness of this cooperative conservation program can best be judged by the fact that from a low point of less than 150,000 seals in 1911, the Pribilof seal herds have been increased to 1.5 million animals, a level which is being successfully maintained. The smaller herds of the Commander and Robben Islands are being built up to a level which will provide the greatest annual harvest year after year.

During the 1961 season the commercial take by the United States on the Pribilofs totaled 95,974 seals made up of 82,099 males and 13,875 females. The female kill forms part of the research and management program approved by the Commission at previous meetings. The Soviet take on the Commander and Robben Islands included 11,970 males and 63 females for a total of 12,033 animals.

The fur seals of the North Pacific are not to be confused with the common hair seals which are widely distributed throughout the world. The difference lies in the soft, velvety underfur that largely accounts for the fur seal's economic importance.

The North Pacific fur seals are mammals that live the greater part of their lives in the sea. The male seals, called bulls, are of considerable size and may weigh up to 700 pounds although 500 pounds is considered average. The females are much smaller, averaging 75 pounds and sometimes reaching a weight of 100 pounds.

The bulls arrive at the breeding grounds early in April or May and establish favorite places along the shore. The females reach the rookeries early in June and within a few days each gives birth to one pup. Mating takes place within a short time and another pup will be born approximately one year later.

The females are vigorously sought after by the bulls and are gathered in harems which may contain as many as 40 females. The bull jealously guards his harem to prevent any of the cows from straying and the encroachment of other males. At one time it was thought that this vigil on the part of the male was constant throughout the period that the animals spent on the breeding grounds but recent research by Russian scientists on Robben Island indicates that the bulls may make short trips to sea and return to another harem.

As only females and pups are allowed in the harems by the bulls, the young males which have not yet attained maturity, or a harem, are segregated from the rest and band together away from the family groups. It is from these bands of "bachelors" that each year's quota is taken by the commercial killing operation, but a sufficient number is left to provide replacements for the older bulls. As a natural advantage to the propagation of the herds the elimination of these young bulls is desirable. They are very belligerent when they reach maturity at six years. If the breeding grounds were overcrowded with them, many young pups would be crushed to death in the numerous and tremendous battles between the young aspirants to a harem and the tough, older "beachmasters."

In their natural environment the seal herds face danger from various predators especially when, at the age of about four months, they venture into the stormy and treacherous waters of the North Pacific. Killer whales seem to be a principal predator and certain parasitic organisms also take a toll.

MARINE OILS

ESTIMATED WORLD PRODUCTION IN 1962:

World production of marine oils (including whale and sperm whale oils, and fish and fish-liver oils) in 1962 is expected to show only a slight increase over the record in 1961. Fish oil output in Peru and the Republic of South Africa will continue to expand, but much more slowly. Excluding the Antarctic, increased whaling operations by Japan and the Soviet Union will result in a slightly larger world outturn of sperm oil.

Table 1 - Estimated World Production of Marine Oils, 1957-62

Type	1962 1/	1961 2/	1960	1959	1958	1957
	(1,000 Short Tons)					
Whale	450	450	425	415	435	440
Sperm whale	140	130	120	130	135	110
Fish (including liver)	680	670	565	575	515	485
Total	1,270	1,250	1,110	1,120	1,085	1,035

1/Forecast.
2/Revised.

International (Contd.):

ATOMIC-PROPELLED MARINE RESEARCH VESSEL

The European Nuclear Energy Agency, OECD's cooperative atomic organization, met in Le Havre, France, on January 25, 1962, to look into the possibilities of building an atomic-propelled marine research vessel. Denmark was represented by an engineer from Burmeister & Wain's reactor division in Copenhagen, according to a report in Berlingske Tidende, January 22. A proposal is being made to build an atomic-propelled vessel, about 330 feet long, especially adapted and equipped for marine research and the education and training of young marine research scientists from many countries. The Danish oceanographer, the late Dr. Anton Bruun, a few years ago, proposed building an international marine research vessel. When he submitted the plans for an atomic-propelled research vessel for an opinion of the Atomic Energy Commission, shortly before his death, he was enthusiastic for the project.

It is now planned that a special committee of experts will be established to develop further the detailed plans like the committee which currently is working with Kockums Mekaniska Verkstads AB in Malmö, Sweden, to prepare plans for an atomic-propelled bulk carrier.

The marine research vessel will be equipped with laboratories, and there is under consideration something wholly new--a large well in direct connection with the ocean, so that the scientists can conduct their research under much more favorable conditions than if they only were able to work along the sides of the vessel. (January 22 report from the Regional Fisheries Attache, United States Embassy, Copenhagen.)

Canada

BRITISH COLUMBIA SHUCKED OYSTER PRODUCTION, 1961:

British Columbia's shucked oyster production in 1961 was substantially higher than the previous year, but still considerably lower than the 92,741 Imperial gallons produced in 1959.

British Columbia Oyster Meats Production, 1960-61

Imperial Measures	1961	1960
Half-pints	357,866	377,394
Pints	22,605	18,569
Quarts	39,235	24,977
Gallons	47,460	43,701
Total in Imperial gallons	85,971	78,384

Prices to producers for shucked stock in December 1961 were as follows for Imperial measures: half-pints, C$0.33-0.40; pints, $0.55-0.75; quarts, $1.00-1.65; gallons, $3.15-5.25 (Prince Rupert prices not included). In December 1960 the price for Imperial gallons was $3.00-5.25, and in December 1959 it was $4.00-5.25.

The retail price of shucked oysters in Vancouver on January 15, 1962, for an Imperial half-pint was 50-55 Canadian cents as compared to 52-55 cents on January 15, 1960.

Note: See Commercial Fisheries Review, March 1961 p. 47.

* * * * *

BRINE SHRIMP INDUSTRY IN SASKATCHEWAN:

According to several recent articles in the local press, a small specialized industry, known as the brine shrimp industry, which is devoted to the collection and packaging of tiny crustaceans and their eggs, is being moved from Great Salt Lake in Utah to Lake Manitou, Saskatchewan. These crustaceans, known as brine shrimp, are used as food for aquarium fish.

It has been said that the industry is moving from Great Salt Lake in Utah because the source there is drying up and only Saskatchewan appeared to have lakes with a sufficiently high saline concentration to replace it.

The first United States firm to begin similar operations in Saskatchewan built a plant at Watrous, near Lake Manitou, in the spring of 1961. The firm at the outset employed about 20 persons and expected to double the size of its operation the winter of 1961/62. Since the arrival of that company, the Saskatchewan provincial Fisheries Branch is said to have received inquiries from other firms in Eastern Canada and the United States.

Fisheries authorities believe that expansion up to $500,000 a year may be expected

Canada (Contd.):

in this industry as there are other lakes in Saskatchewan which have a sufficiently high saline content to produce this type of shrimp. It has been estimated that Lake Manitou alone could produce 10.5 million pounds of brine shrimp annually without endangering future supplies. The company now in operation uses only about 0.1 percent of the Lake Manitou supply. This company is now producing both brine shrimp and eggs for feeding aquarium fish.

The report claims that frozen brine shrimp now have a retail value of approximately $3.50 a pound and the shrimp eggs about $80 a pound.

Both the company now operating and the company moving from Great Salt Lake expect to find markets for their products not only in Canada and the United States but also in West Germany and other countries where purchases are expected to expand with the increase in popularity of aquarium fish.

The industry expects to operate on a year-round basis and under this method the shrimp would be collected and frozen during the summer months. In the winter months it would be cleaned and packed for marketing.

According to information received from the Deputy-Minister of Natural Resources in Regina, the press report describes generally the progress of the industry in Saskatchewan during the past summer, but some of the opinions expressed therein are purely generalizations. The possible yield figure, for example, was based on the calculated volume of Little Manitou Lake and a measurement of the abundance of shrimp taken during a sampling in 1960. He has stated that to date there is only one company involved in the development of the industry in the Province and that shipments thus far have been by truck on an experimental basis to the United States distributor. The main source of demand in the past has been the North American Aquarist. Small quantities have also been shipped to Western Europe. However, he anticipates that there will be a large market in government and private fish hatcheries in the future; in particular the commercial hatcheries in warmer latitudes which may very effectively use this food for young fish. There has been no confirmation of the market prices quoted in the newspaper reports. (United States Consulate, Winnipeg, January 2, 1962.)

Ceylon

STATE CORPORATION FOR FISHING INDUSTRY PROPOSED:

The latest state corporation reported under consideration is one to handle all aspects of the fishing industry. According to press reports, this recommendation was made by the Parliamentary Advisory Committee of the Ministry of Agriculture, Lands, Irrigation and Power. The proposed corporation would assume the functions now performed by the Cold Storage plant at Mutwal which is run by the Fisheries Department and the Cooperative Fish Sales Union. It would also undertake deep-sea and trawler fishing.

The Fisheries Department has been making unsuccessful attempts to interest private firms into undertaking the exports of spiny lobster tails for which there is a ready market in the United States. The only large private company now expanding its facilities intends to specialize in tuna fishing. (Report of January 26, 1962, from the United States Embassy, Colombo.)

Chile

UNITED STATES $5 MILLION LOAN TO CHILE FOR FISHERY PROJECT APPROVED:

A United States loan of $5 million for a fishery project is included in the Inter-American Development Bank approval on December 21, 1961, of seven loans, totaling the equivalent of $27,110,000, to finance four economic and social development projects in Chile.

The loan will finance 53 percent of the cost of establishing the fishing enterprise of the Empresa Pesquera de Tarapaca. The project will include the catching, freezing, and canning of fish and the manufacture of fish meal and oil. Fish to be caught include tuna, bonito, mackerel, sardines, and anchovies. Production will be primarily for export and is expected to produce net foreign exchange earnings of $6 million a year.

Nine United States banks are participating in the early maturities of the loan for a total

Chile (Contd.):

of $250,000 without the guarantee of the Inter-American Bank.

The loan, which will cover most of the foreign exchange costs of the project, will be used to purchase machinery and equipment for processing the catch and for a fishing fleet of 18 vessels. The company has signed a contract with a marine construction company of Seattle, Wash., for technical assistance and quality control during the early years of operation.

The loan will be granted for a term of 12 years and will bear interest of 5¾ percent annually, including the 1 percent commission allocated to the Bank's special reserve. Repayment will be made in 18 semiannual graduated installments, beginning three and one-half years after the signing of the loan contract.

Denmark

FISHING LIMITS DISCUSSED BY FISHERIES MINISTER:

The question of expansion of Denmark's fishing limits has faded into the background with respect to the coming negotiations on membership in the Common Market. But this is not tantamount to a loss of interest in the problem, according to newspaper reports of an interview with the Danish Fisheries Minister after a recent meeting in Copenhagen of the Economic Committee of the Nordic Council.

The Minister stated that Denmark will demand extension of its territorial waters and the fishing limits, if other countries decide on a similar expansion and limit foreign fishing rights. This applies especially to the countries where Danish fishermen have extensive fisheries. Extension of the present three-mile limit would be of importance to the Danish west coast fishermen who, naturally enough, wish to have the profitable common sole fishery to themselves.

Within Danish fishery circles, opinions on an extension of the fishing limits have been divided, according to the Minister. Many believe that fishing rights should be secured as far out as possible with respect to the Danish coastal fisheries. But others, namely the fishermen who fish near the German and Norwegian coasts, take the view that Denmark should retain the old three-mile limit because it has the advantage that the Danish fishermen also can fish up to three miles from foreign coasts.

The Government has not received any demand for an expansion from the fishermen's side, and the Minister added that his impression is that the matter is quiet. There hardly will be any expansion in the foreseeable future, even if an existing agreement with the other North Sea countries (with the exception of Norway and Sweden) can be terminated with one year's notice.

With regard to the Faroe Islands, the agreement with the British Government is effective until April 1962. This agreement maintains the six-and-six principle so that there are certain areas between 6 and 12 nautical miles where, at certain times of the year, British fishermen cannot fish. The Government is considering whether it should give notice to terminate the agreement in order to effect a full 12-mile limit. Greenland also wants a 12-mile limit. The Government has taken no position yet but it probably will comply with Greenland's wishes.

In his report the Minister mentioned negotiations which have taken place with Norway on the Skagerak area, where Denmark has not been able to accept the Norwegian proposal because it feared an expanded Norwegian fishery in the area. It was the Minister's opinion, however, that agreement would be reached on this problem which, at the moment, is suspended. (January 3, 1962, report from the Regional Fisheries Attache, Copenhagen.)

Faroe Islands

FISHERY FACTORYSHIP PLANNED:

Faroese ship owners are negotiating with a ship builder in Bremerhaven, West Germany, for the construction of a fishery factoryship of 1,500 gross tons which will require a capital outlay of 8 to 9 million kroner (US$1.2-1.3 million), according to Danish newspaper reports.

The factory vessel would be the first of its kind for the Faroe Islands. It would ice

Faroe Islands (Contd.):

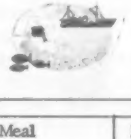
and quick-freeze fish and be equipped with filleting machines and fish meal and oil machinery. The catch would be handled below decks. Most of the fishing would be done in Greenland and Newfoundland waters. Delivery would be expected in 14 months. (United States Fisheries Attache, Copenhagen, report of January 2, 1962.)

* * * * *

EXPORTS OF FRESH, FROZEN, AND SALTED FISH:

As a result of the Danish Government's decision to abolish on January 1, 1961, the approximately 4 percent premium for sales to the dollar area, exports of Faroese frozen fillets to the United States have decreased markedly, according to a newspaper report from Thorshavn. To Faroese exporters the premium amounted to about 14 öre per kilogram (slightly less than 1 U.S. cent a pound). Exporters are now concentrating on increased shipments to the United Kingdom where one firm is receiving substantial quantities of Faroese frozen fish products. Between 150 and 200 metric tons have been shipped to Grimsby in the past month. Exports of fresh fish to the British market also increased considerably in 1961.

Of the 1961 production of 110,000 barrels (11,000 metric tons) of salted herring, 80,000 have been sold on the Danish and Swedish markets, and East Germany has finally agreed to take 20,000 barrels. Faroese export circles hope that Danish and Swedish importers will buy the 10,000 barrels remaining unsold. (United States Fisheries, Attache, Copenhagen, report of December 28, 1961.)



German Federal Republic

FISH OIL MARKET:

According to the leading local fish oil importer, sales of imported oils in West Germany during December 1961 continued to be sluggish, in view of adequate stocks in the hands of margarine manufacturers. The one large British firm which has branches in West Germany has reportedly continued to limit its fish oil purchases to small exploratory transactions. These factors have had a depressing effect on price levels.

The price of United States menhaden oil has decreased from about US$120 per metric ton (5.4 U.S. cents a pound), c.i.f. Rotterdam, in early December 1961, to about $114 (5.2 U. S. cents a pound) early in January 1962. The fish oil importer believes that the price of United States menhaden oil will not drop much further, because United States fish oil producers are reportedly increasing their sales in the United States and in Canada.

The price for Peruvian fish oil has declined from about $116 (5.3 cents a pound) to $112-113 a metric ton (5.1 cents a pound), c.i.f. Rotterdam, for prompt delivery. Contracts for delivery of Peruvian fish oil in April-May-June 1962 are being negotiated at about $110 a metric ton (5.0 cents a pound).

German fish oil was quoted as of January 12 at $112-118 a metric ton (5.1-5.3 cents a pound) ex-factory. (United States Consulate, Bremen, January 12, 1962.)

* * * * *

FISH MEAL PRICES, JANUARY 5, 1962:

Prices reported at Hamburg Commodity Exchange as of January 5, 1962, for fish meal delivered ex-Hamburg warehouse, or c.& f. West German sea port were as follows:

Type of Fish Meal	Protein Content (%)	Delivery	DM/Metric Ton 1/	US$/Short Ton
German	50-55	loco/prompt	640.00	145.15
"	55-60	prompt/Jan. 1962	650.00	147.42
"	60-65	January 1962	660.00	149.69
Peruvian	65-70	January 1962	682.50	154.79
"	65-70	February 1962	585.00	132.68
"	65-70	March 1962	565.00	128.14
"	65-70	Apr.-Aug. 1962	557.50	126.44
Angola	65-70	Jan.-Feb. 1962	680.00	154.22
Portuguese	50-55	prompt/Jan. 1962	625.00	141.75
Icelandic herring	70-75	prompt/Jan. 1962	737.50	167.26

1/Values converted at rate of 4.0 deutsche marks equal US$1.
Note: "Loco" means where and as it is at the time of sale, and all subsequent expenses to be at buyer's account.

German Federal Republic (Contd.):

Since late November 1961, fish meal prices at the Hamburg Exchange have shown a marked increase. West German fish meal manufacturers and dealers assert that the price increases reflect increasing demand for fish meal not only in West Germany but also in other West European countries. Furthermore, these sources state that fish meal production in several important European fishery nations dropped significantly in 1961. In West Germany, for example, the output of fish meal in 1961 decreased about 22 percent to about 65,000 metric tons. Some sources hold that a more skillful manipulation of fish meal exports by the Peruvians to be partly responsible for the price increases. Others believe that dealers, who refrained from purchasing in view of the speculative elements introduced into the fish meal market in 1961, now find themselves in short supply and have begun rebuilding their stocks, thus creating what is believed to be a temporary increase in demand. (United States Consulate, Bremen, January 12, 1962.)

* * * * *

GOVERNMENT AID FOR FISHING INDUSTRY:

The progressive deterioration in the financial position of the West German trawler trade has led to a strong plea for expanded government support. In response to a motion adopted by the Bundestag (Parliament), the West German Government has made an investigation and submitted its findings to the Bundestag.

In the first section of its report, the Government compares the status of the West German fisheries with those of other West European fishery nations and arrives at the conclusion that the West German fishery trade, the fourth largest in Western Europe and one possessing a high rate of productivity, like other European fisheries is undergoing structural changes with regard to fishing techniques, shifts in fishing grounds, and processing of fish aboard vessels. The Federal Government further finds that many foreign fisheries enjoy numerous advantages over the German fishing trade, such as more favorable geographical locations, less war loss, no postwar currency devaluation, higher government support, subsidies, tax privileges, more intensive research, protective trade barriers, etc. The Government report emphasizes the extraordinary interdependence of the various sectors of the fish trade and the fact that the value of raw fish increases by an average of 265 percent in West Germany before it reaches the consumer. After describing Norwegian and British support of the fishing trade in some detail, the report points out that important West European countries subsidize their fisheries in order to maintain the basis for secondary industries, which apart from stimulating the economic life in coastal areas, in the final analysis yield taxes surpassing considerably the subsidies granted from government funds.

In assessing the importance of the fish trade within the national economy, the Government reports that a total of 18,300 firms in all sectors of the fish trade employ about 97,000 people and transact a DM 3.8 billion (US$950 million) business per year. Smaller catches have reduced the share of West German fisheries in the over-all national fish supply from 83-89 percent in the years 1950-1958 to 75 percent in 1959-60. In view of its need for foreign fish supplies, the Federal Government actively supports the development of a liberal fish trade policy within the Common Market (EEC). It also expects that the Common Market will provide additional sales opportunities for the West German fish trade. The merger of the EEC with European Free Trade Association (EFTA) countries would create better conditions for the establishment of a common fishery policy, among other things, aimed at the harmonization of competitive conditions, the promotion of deep-sea fishing, improved cooperation in and coordination of production, and marketing, etc.

In an analysis of the present position of the West German deep-sea fishing trade, the Federal Government, although with a slight shift of emphasis, confirms the reasons for the financial deterioration of the trade advanced by the trade itself earlier in the year. In summary, these causes are: (a) loss of traditional fishing grounds due to the unilateral extension of fishing limits; (b) lower fish catches as the result of changing hydrobiological conditions; (c) high cost of designing and building new types of fishing vessels and adopting new catching techniques; (d) price decline in the fish meal and fish oil markets; (e) higher cost for maintaining and improving fish quality standards in view of the lengthening voyages of fishing boats and the outlawing of certain fish preservatives; (f) distortion of

German Federal Republic (Contd.):

competitive conditions caused by the subsidization of foreign fisheries and the extensive liberalization of fish imports by the Federal Republic.

In 1957, 85 percent of all trawler companies lost money and in 1958 about 50 percent of all firms operated in the red. Net earnings, before taxes, dropped from about 2 percent in 1959 to about 1 percent in 1960. According to the report, medium and long-term debts of the trawler trade currently amount to DM 150 million ($37.5 million), of which DM 127 million ($31.7 million) was obtained through commercial loans. Repayment plus interest require DM 28 million ($7.0 million) annually.

The Government report also reviews the status of the West German lugger and cutter fisheries, which is found to be critical, partly because of the reasons that also led to a deterioration of the trawler trade, partly because of the special features of these fisheries, such as seasonal operations, overspecialization in catching fish for the reduction industry, inefficient marketing systems, slow adoption of new fishing techniques, and a progressive obsolescence of the lugger and cutter fleets.

The Government report on the status of the West German fisheries fails to meet the parliamentary instruction in one important respect, namely "to state whether the budgetary means for promoting the fisheries must be increased, or additional support is required."

Since the publication of the Government report, trade and Government officials have been cooperating in determining the extent of support necessary to tide the fisheries over their present ebb.

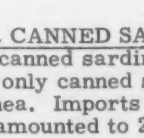
The Association of Deep-Sea Fisheries has submitted to the Government a detailed support program for five years, assuming that within such a period it will be possible to harmonize to a significant degree the competitive conditions among the major fishing nations of the EEC and the EFTA. The trade also requests that the extended support be granted equally to all firms, without regard to size or efficiency so as not to hamper a selective development of the trade. The trade support proposal comprises the following annual expenditures:

	Million DM	US$ 1,000
1. Subsidies (patterned after the English system) in the amount of 9 percent of the gross proceeds of all landings (possibly differentiated according to catching areas)	17.0	4,250
2. Support of amortization of DM 110 million ($27.5 million) in ship mortgages	6.6	1,650
3. Subsidies to lower interest rates payable on DM 110 million ($27.5 million) from 5 percent to 2 percent	3.3	825
4. Support for the construction of 10 new trawlers at DM 5 million ($1.3 million) at 5 percent	2.5	625
5. Scrapping premiums of DM 400 ($100) per GRT for 25 trawlers of 500 GRT (This amount would be reduced to 15 vessels in the second year and to 10 trawlers in the subsequent three years.)	5.0	1,250
6. Sales promotion (The support would match the amount borne by the trawler trade itself for this purpose.)	3.0	750
7. Exploration of fishing grounds: Charter of a commercial trawler until new government research vessel will be placed into operation	1.2	312
Total	38.6	9,662

The inclusion of the lugger and cutter fisheries in the above program would raise support requested under the items 1, 2, and 3 as follows:

1. From DM 17 million ($4,250,000) to DM 25 million ($6,250,000)
2. " " 6.6 " ($1,650,000) " " 9 " ($2,250,000)
3. " " 3.3 " ($ 825,000) " " 4.5 " ($1,125,000)

Hence, total support requested by the German fishing trade amounts to about DM 50 million ($12.5 million), of which DM 25 million ($6,250,000) would be for direct subsidies. (United States Consulate, Bremen, December 20, 1961.)



Guinea

MARKET FOR CANNED SARDINES:

Among the canned sardine and sardine-like products, only canned sardines are imported by Guinea. Imports of canned sardines in 1960 amounted to 241,000 pounds,

Guinea (Contd.):

valued c.i.f. Port of Conakry at 15,204,000 Guinean francs (US$61,500), all from Morocco. This is a reduction of about one-third from the average imports of the three previous years. Data on imports for 1961 are not available. All imported sardines are packed in oil.

Canned sardines in Guinea are normally consumed only by the dwindling European community and a relatively small number of Europeanized Africans.

The import duty on all canned fish products is 50 percent of the c.i.f. value. It is doubtful that import licenses or exchange allocations would be granted for canned sardines of United States origin since Guinea has a bilateral trade agreement with Morocco in which canned sardines are included. (United States Embassy, Conakry, January 12, 1962.)

Iceland

FIVE FISH-FREEZING PLANTS FORM NEW EXPORT ASSOCIATION:

Five Icelandic freezing plants representing 5.2 percent of the Icelandic production capacity have left the Freezing Plants Corporation sales organization for a new export organization. The businessman heading the new organization has leased two of the plants and represents the three others as sales agent. Working largely through a group of firms in Great Britain, the businessman has already received licenses to export 3,000 metric tons of frozen fish at a reportedly higher price than that obtained by the two existing frozen fish sales organizations, the Samband and the Freezing Plants Corporation. The latter have hitherto controlled about 20 percent and 80 percent, respectively, of Iceland's frozen fish exports.

The Freezing Plants Corporation concluded contracts in January 1962 with a British firm for the sale of a large amount of frozen unskinned cod fillets at 8 kronur (about 18.6 U. S. cents) per pound. (United States Embassy, Reykjavik, January 11, 1962.)

* * * * *

NEW FISH PRICING BOARD ESTABLISHED:

On December 16, 1961, the Icelandic Althing passed an act which should make it possible to set fish prices more rapidly. A bill to establish a fish pricing board was introduced into the Althing on December 8, 1961, by the Minister of Fisheries. Main discussion centered on the extent to which representatives of the fishermen's unions should participate in fish pricing negotiations between the processors and the fishing vessel owners. In the past, the labor unions representing the fishermen have been suspicious of prices reached in negotiations between these two groups who are often the same people, as many fish freezing plants and fishing vessels are owned by the same organizations.

Normally, the fish price for the main January through mid-May fishing season is set by negotiations starting the end of December between the groups named, accompanied by charges from the fishermen's unions. Often these negotiations drag on well into the fishing season, leaving uncertainty and division, and sometimes holding up the opening of the main fishing season. The new act establishes a board to fix the minimum prices of all fish species sold for processing in Iceland as well as on those exported in fresh and unprocessed form. The board also obtains information on local fish prices and production costs and foreign market prices, and is instructed to base its pricing on market prices of fisheries products in foreign markets. It should reach agreement on fish prices for one year ahead, if possible, and never for a shorter period than a complete fishing season. The board is empowered to fix the prices for cod, haddock, and other white fish as well as for shellfish and herring. The board is organized in different ways depending on the type of fish involved.

A 12-member group is charged with determining prices for the white fish; 6 of these represent the fish buyers; 3 from the Freezing Plants Corporation, 1 from the Union of Icelandic Fish Producers (saltfish), 1 representing the plants within the Samband, and 1 representing the Union of Stockfish Producers. The following make up the 6 representing the sellers: 3 from the Union of Icelandic Fishing Vessel Owners, 1 from the Icelandic Federation of Labor, 1 from the Icelandic Seamen's Federation, and 1 from the Federation of Merchant Marine and Fishermen. The latter is the officers' union.

As for setting prices on herring caught off the north and east coasts, representatives of the sellers of fish will be from the same organizations in the same numbers, while the fish purchasers will be represented along the following lines: 1 from the Freezing Plants Corporation, 1 from the Samband, 2 from the Union of North and East Coast Herring Salters, 1 from the State Herring Reduction Plants, and 1 from the Union of North and East Coast Herring Reduction Plants. The same arrangement will apply for representation of sellers of herring caught off the south and west coasts, but the representation of the buyers will be as follows: 2 from the Freezing Plants Corporation, 1 from the Samband, 2 from the Union of South and West Coast Herring Salters, and 1 from the owners of herring reduction plants on the south and west coasts.

In the event that disagreement occurs within these boards in arriving at fish prices before the time specified[1] expires, the question is referred to a 5-member board of arbitration. This board is made up of 2 members from the fish sellers, 1 representing the Union of Icelandic Fishing Vessel Owners,[2] and the other from the seaman's unions. Two representatives from the fish buyers will sit on the board, of whom at least one shall be appointed by the aggrieved party. These four members of the board are expected to agree on a neutral fifth member of the board. However, if the board does not select a fifth member within two days, the Supreme Court is to appoint the fifth member of the board of arbitration. This board's decisions are then binding on a straight majority basis.

The pre-February 1960 fish pricing arrangement had left final fish price-fixing powers to the Government, following

Iceland (Contd.):

negotiations between the fishing vessel owners and processors. The Government then set the fish prices and paid the export subsidy required as a result of the unrealistic exchange rate. The economic stabilization program removed the Government from setting fish prices and wages.

Although the procedures voted into being in December 1961 should streamline the former cumbersome methods for arriving at landed fish prices and should allay some union suspicions of vessel owner-processor collusion, it will by no means guarantee an easy price fixing path. The Icelandic Federation of Labor demanded in late December 1961 that the seamen's share of the fish catch be increased from 29-1/2 percent to 34 percent, thereby opening up another aspect of the fish price question. (United States Embassy, Reykjavik, January 4, 1962.)

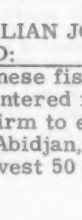
1/ The time permitted the fish pricing boards and board of arbitration for fixing fish prices has not yet been set, but will be the subject of a subsequent regulation.
2/ This member must be one without any interest in fish processing plants.

* * * * *

FROZEN HERRING SALES:

With a glut of herring at the oil and meal reduction plants, Icelandic processors stepped up the freezing of herring. By January 6, 1962, the Freezing Plants Corporation had frozen 11,140 metric tons of herring from the South Coast winter catch. Of this, 3,250 tons had been sold to West Germany and 2,500 tons to Poland. Uncertainty prevailed regarding negotiations to sell the Soviet Union 5,000 tons because of good catches by that country's herring fleet. Rumania was interested in purchasing 1,000 tons, posing a problem of what Iceland could purchase in return. Both the Czechs and East Germans had also expressed interest in frozen herring, but their barter trade balances were already in bad balance.

The remaining frozen herring may well be sold in Great Britain or elsewhere in Western Europe. Further processing of frozen herring was expected to slow up because of the unwillingness of the banks to advance further operational credits until sales contracts have been concluded to cover the product. (United States Embassy, Reykjavik, January 11, 1962.)



Ivory Coast

JAPANESE-ITALIAN JOINT TUNA BASE PLANNED:

A large Japanese fishing company is reported to have entered into an agreement with an Italian firm to establish a joint tuna fishing base at Abidjan, Ivory Coast. Each company will invest 50 percent in the enterprise. The Japanese firm reportedly has submitted an application to the Japanese Fisheries Agency for approval of the venture. Detailed information regarding this joint fishing base is not available but apparently the construction of a large freezing plant at Abidjan for storing tuna is included in the plan. (A translation from the Japanese fishery periodical Shin Suisan Shimbun Sokuho, January 26, 1962.)

Japan

PRODUCERS RECOMMEND 100,000-TON QUOTA FOR FROZEN TUNA EXPORTS TO U. S.:

The two subcommittees of the Export Frozen Tuna Producers Association, one responsible for exports from Japan proper and the other for transshipments, met separately on January 23 and 24, 1962, to draft recommendations governing exports of frozen tuna to the United States in 1962, according to the Japanese periodical Suisan Tsushin of January 25, 1962. The views of the two committees were:

1. Direct shipments from Japan proper:

a. Frozen tuna export quota to the United States for 1962 be set at 100,000 short tons. The Exporters Association is considering an annual export quota of 110,000 short tons, but indications are that frozen tuna exports to the United States in 1962 will only amount to about 95,000 short tons (direct shipments from Japan proper, 68,000 tons; transshipments, 27,000 tons).

b. Frozen tuna exports from Japan proper be allocated as follows:

Species	Recommended Quota	Present Quota
	(Short Tons)	
Albacore	30,000	32,500
Yellowfin	35,000	37,500
Total	65,000	70,000
Tuna loins	4,800	4,800

c. Existing methods of allocating the export quota (i.e. on the basis of past performance records, with reserves held for later allocation to those companies that rapidly consume their quota) be applied to albacore and yellowfin and that the unassigned quota be increased for tuna loins.

d. A special committee be appointed to study the joint sales system.

Japan (Contd.):

2. Transshipments:

a. Continuation of present system and restrictions.

* * * * *

TUNA PRICES TO CATCHER VESSELS IN MOTHERSHIP FISHERY:

The Japanese Tuna Mothership Association, made up of Japan's three largest fishery firms, has substantially agreed on the following prices to be paid in 1962 to catcher vessels delivering fish to tuna motherships:

Species	Price	
	1962	1961
	(US$ Per Short Ton)	
Albacore	189	176
Yellowfin, large	113	111
Yellowfin, medium	164	156

(Translated from Japanese periodical Suisan Keizai Shimbun, January 21, 1962.)

* * * * *

TUNA MOTHERSHIP COMPANIES TO REQUEST LIBERALIZATION OF FISHING RESTRICTIONS:

The three largest Japanese fishing companies which operate tuna motherships in the South Pacific Ocean are planning to submit a petition to the Fisheries Agency requesting: (1) elimination of restrictions on fishing grounds; (2) increase in catch quota; (3) liberalization of restrictions on catcher vessel sizes; (4) revival of use of portable vessels.

According to the three companies, the tuna mothership fleet presently consists of a total of 5 motherships and 196 catcher vessels. Although this represents an increase in the size of the fleet since the beginning of the tuna mothership-type fishery five years ago, the fleet operates on the same fishing grounds due to area restrictions imposed on it. As a result, fishing grounds are crowded and this lowers efficiency.

On the other hand, tuna long-line vessels operating out of base ports are not restricted in their movements and thus are able to operate on the best fishing grounds. Catcher vessels assigned to the motherships possess the same type of fishing license as do the land-based long-line vessels but they are not permitted this freedom of movement, merely because they are serving the motherships. Also, area restrictions placed on the motherships serve only to hamper their mobility, which is their unique characteristic. These restrictions should be abolished so as to permit tuna motherships to operate at 100-percent efficiency. (Tuna motherships are presently restricted to the following areas: North of the equator--area east of 170° W. longitude; equator to 25° S. latitude--area east of 170° E. longitude; and south of 25° S. latitude--area east of 160° E. longitude.)

As for increasing the catch quota, which was raised a year ago to 22,900 metric tons, the tuna mothership companies want the quota to be increased by another 4,000 metric tons or so this year, to 27,500 metric tons. They contend that as a result of the liberalization of the vessel construction law (effective December 1960) permitting construction of larger fishing vessels, production of land-based tuna vessels in 1961 can be expected to increase nearly twofold over 1954 production, which amounted to about 180,500 metric tons. This is possible since the land-based tuna vessels do not have any catch limits imposed on them. Catcher vessels assigned to the motherships should also be allowed to operate at their full capabilities. Besides, the system of retiring fishing vessels for the purpose of augmenting catches is rather complicated and rather than rely on that method, an outright increase in catch quota is desired. (By retiring a fishing vessel of a certain size for a specified length of time, tuna motherships are permitted to catch a fixed amount of tuna beyond their quota allocation for each vessel taken out of the fishery.)

On the question of vessel size, tuna motherships cannot employ fishing vessels of over 200 tons gross. With bigger vessels being built all the time, the companies are experiencing difficulty in chartering fishing vessels. They want to see this restriction on catcher vessel size liberalized so as to permit utilization of catcher vessels up to 300 tons gross and scout ships up to 350 tons gross.

Concerning use of portable vessels, the tuna mothership companies want up to four portable vessels authorized per mothership. The portable vessels would be used for conducting tests on gear and for making resource surveys. (Translated from Japanese periodical Suisan Keizai Shimbun, January 21, 1962.)

* * * * *

CANNED TUNA SALES FOR EXPORT TO UNITED STATES:

The Japan Canned Foods Exporters Association held a meeting of its Tuna Sales Standing Committee on January 12, 1962, to discuss the second sale of canned tuna in brine for export to the United States. The Committee decided to sell, at prevailing prices[1/], 130,000 cases (No. ½, 7-oz. 48's) of canned white meat tuna and 130,000 cases (No. ½, 7-oz. 48's) of canned light meat tuna, totaling 260,000 cases, to be shipped to the United States by March 20. For the first sale, 100,000 cases of light meat tuna and 130,000 cases of white meat tuna had been offered.

The chairman of the Tuna Sales Committee stated at the meeting that the packers wanted to raise export prices but he explained to them the difficulty of increasing prices under present market conditions, whereupon the packers agreed not to press for an increase in export prices. (Suisan Tsushin, January 13, 1962.)

1/Prevailing f.o.b. Japan prices for canned tuna in brine for export to the United States are: $9.95 per case for white meat tuna and $7.70 per case for light meat tuna.

* * * * *

EXPORTS OF CANNED TUNA SPECIALTY PACKS:

Data compiled by the Canned Tuna Producers Association show that exports of spe-

Japan (Contd.):

cialty canned tuna products (other than those packed in brine and in oil) totaled 156,234 cases for the period April-November 1961. Exports to West Germany totaled 127,308

Japanese Exports of Tuna Specialty Packs, April-November 1961

Product	No. Cases
Vegetable tuna	89,538
Jelly tuna	41,489
Seasoned tuna	21,100
Curry tuna	3,150
Tuna in tomato sauce	139
Others	818
Total	156,234

cases and to the Netherlands 13,687 cases, according to a translation from the Japanese periodical Suisan Tsushin, January 27, 1962.

* * * * *

PENANG AND SINGAPORE PROPOSED AS TUNA TRANSSHIPMENT BASES:

The Japanese fisheries company which established the joint Japanese-Malayan tuna fishing and canning company located at Penang, Malaya, held a special stockholders meeting on January 23, 1962, according to translations from the Japanese periodical Suisan Tsushin (Jan. 24 & 29, 1962). Resignations of the officers and directors of the Japanese company were accepted following presentation of reports on the financial status of the Malayan enterprise. Stockholders agreed to place management of the joint Malayan-Japanese enterprise primarily under the control of the Mie (Prefecture) Tuna Cooperative Association, and also voted to redistribute a total of 34,000 unsubscribed shares to members of the Mie Tuna Association and other regional associations.

Members of the National Federation of Japan Tuna and Skipjack Fisheries Cooperative Associations reportedly agreed that the Malayan base should not be managed by the Mie Tuna Association alone but should be developed jointly by all regional cooperative associations. However, since the Mie Association will have to be depended upon heavily for financial support to overcome the present financial difficulties of the Japanese firm operating the Malayan operation, that Association's dominant position in that company's management remains basically unchanged.

In connection with the reorganization of the Japanese firm operating the joint Malayan-Japanese plant, opinions are being expressed that even if that company's Malayan plant should be permitted to export 36,000 cases of canned tuna to the United States, it will be difficult for that company to greatly improve its deficit operations; thus, this will serve to intensify the move to utilize both Penang and Singapore as bases for Japanese tuna vessels operating in the Indian Ocean.

Japanese tuna vessels which primarily operate in the Indian Ocean are estimated to number about 80-100. Of those, about 20 to 30 vessels would like to utilize Penang and Singapore as bases, and officials connected with the Japanese fisheries company operating the Malayan tuna plant are requesting that both Penang and Singapore be designated ports of transshipment so that tuna taken in the Indian Ocean can be exported to the United States from those two bases. At the present time, Japanese tuna long-liners operating in the Indian Ocean reportedly take on fuel at Singapore on their return trip to Japan. Designation of Singapore and Penang as bases of transshipment will mean that those vessels can unload their catches at those ports and return directly to the Indian Ocean fishing grounds, without being required to make the long return trip to Japan to unload their catches.

Present plans call for dispatching 4 to 5 tuna (ice) vessels of 100-150 tons gross to Malaya. Hope is held that catches made by those vessels will be handled under a special quota, like that allotted to the Japanese tuna base at Espiritu Santo, New Hebrides Islands. However, this seems most unlikely since catches made by those vessels for export purposes are expected to be small.

* * * * *

RESEARCH VESSEL TO EXPLORE INDIAN OCEAN TUNA RESOURCES:

The Japanese Fisheries Agency's research vessel Shoyo Maru (602 gross tons) departed Tokyo on January 10, 1962, on an 80-day exploratory cruise to the southern Indian Ocean to investigate tuna resources. The Shoyo Maru expected to proceed first to Penang, Malaya, and then to Port Louis, Mauritius Island (east of Madagascar Island), from where it will survey the waters south of the fishing grounds now being fished by Japanese vessels to as far south as 40° S. latitude. The Shoyo Maru will not only conduct exploratory fishing for tuna but will also attempt to collect tuna larvae from waters around the Mauritius Island, which is believed to be the spawning area for albacore.

Research objectives are: (1) Study geographical distribution and abundance of important species of fish. (2) Study catch composition, catch quantity, and hook rate by fishing ground. (3) Collect data on water depth, water temperature, currents, etc., and relate their effects on fishing. (4) Conduct observations on fishing methods, water color, and vertical water temperature. (5) Collect measurements on lengths and weights of yellowfin, big-eyed, bluefin, and albacore tuna and spearfish. (6) Run stomach content analyses. (7) Collect data on gonad weights and determine sexual maturity. (8) Collect specimens.

At Penang, the Shoyo Maru will survey the fishing base operated by a joint Japanese-Malayan tuna canning enterprise, which reportedly is now faced with financial problems. (Suisan Keizai Shimbun, January 10, 1962.)

* * * * *

SHRIMP FACTORYSHIP OPERATION PLANNED IN BERING SEA IN 1962:

A large Japanese fishing company is planning to operate the Einin Maru (7,400 gross

Japan (Contd.):

tons) as a shrimp factoryship in the eastern Bering Sea again this year. Accompanying the factoryship will be 5 pairs of two-boat trawlers. Present plans call for sending the Einin Maru fleet to the waters off the Pribilof Islands in the eastern Bering Sea for five months beginning in April 1962.

Einin Maru's production target for 1962 is 300,000 cases of shrimp (24 8-oz. cans to a case). This target represents a fourfold increase of last year's production of 74,000 cases. In 1961, the Einin Maru also packed 5,400 metric tons of frozen shrimp but in 1962 it will concentrate on packing canned shrimp only. To achieve the 300,000-case target, the fleet will be increased by 4 trawlers to a total of 10 trawlers. New shrimp peeling machinery for installation on the factoryship has been purchased, and the production line will be increased by 2 to a total of 4 lines.

Reportedly, the Einin Maru operated in 1961 at a loss of 150 million yen (US$417,000). This deficit is attributed to an unexpected decline in export prices and high operational costs amounting to about 700 million yen (US$1.9 million). Expenses for the 1962 season are expected to total about 600 million yen (US$1.7 million) and a profit of 100 million yen (US$278,000) is anticipated.

Other major Japanese fishing companies have contemplated engaging in shrimp fishing in the Bering Sea. Indications are that they will not do so this year in view of the tight money situation prevailing in Japan. (Japanese periodical Suisan Keizai Shimbun, January 17, 1962.)

* * * * *

AFRICAN FISHERY INVESTMENTS SOUGHT:

The Japanese Ministry of International Trade and Industry (MITI) is planning to undertake a basic study of fishery investment possibilities in Africa to promote overseas fishery investments during the next Japanese fiscal year (April 1, 1962-March 31, 1963). This survey, which will be the fourth of its kind to be conducted by Japan since 1959 when Pakistan was first explored, will be assigned to the Japanese Overseas Fisheries Cooperative Association.

After completion of the survey, MITI hopes to work out a final plan in cooperation with the Overseas Cooperative Association. MITI is reported to be particularly interested in the West African coast for fishery investments in fiscal 1962. (Suisan Keizai Shimbun, January 11, 1962.)

* * * * *

TRAWLERS FISHING OFF SOUTH AFRICA:

A large Japanese fishing company, which is conducting trawl fishing off the coast of Las Palmas, Canary Islands, has extended its operations to South Africa. In the fall of 1961 it sent two trawlers, Taiyo Maru No. 68 (1,498 gross tons) and another 750-ton vessel, to the waters nearby Cape Town, South Africa. On January 16, 1962, the Taiyo Maru No. 62 was to begin fishing there. Another trawler, Taiyo Maru No. 61, which had been operating in the New Zealand waters, was also scheduled to proceed to South Africa, thus bringing the total number of the company's trawler fleet assigned to the fishing grounds off the coast of Cape Town to 4 vessels.

The firm's trawlers in the South African coast were catching large quantities of sea bream. All fish taken by the trawlers were to be shipped back to Japan, and as of mid-January 3,000 to 3,500 metric tons of fish had been shipped to Japan by means of commercial freighters. (Shin Suisan Shimbun Sokuho, January 17, 1962.)

The 1,500-ton stern trawler No. 10 Daishin Maru was scheduled to be delivered to another Japanese fishing firm on January 25, 1962. Delivery of the vessel marks the beginning of the firm's entry into the distant-water trawl fishery. The Daishin Maru will operate in West African waters. A sistership is scheduled to be completed in May 1962.

Specifications of the Daishin Maru are: Gross tonnage--1,500 tons; length--223 feet; beam--39 feet; engine--2,000-hp. Diesel; maximum speed--14.7 knots; and cruising speed--12.25 knots. (Suisan Keizai Shimbun, January 13, 1962.)

* * * * *

TWO STERN TRAWLERS BEING BUILT:

A large Japanese fishing company is constructing two 1,470-ton stern trawlers--Akebono Maru, Nos. 52 and 53--at a cost of

Japan (Contd.):

400 million yen (US$1.1 million) each. Upon their completion, the trawlers will be dispatched to northern waters (Japanese term used for the Bering Sea, North Pacific, and the Okhotsk Sea area). If year-round operations in northern waters are not possible, the firm plans to fish off West Africa as well.

Specifications of the trawlers are: Length 236 feet; beam 39 feet; freezing capacity 54,185 cubic feet; and cruising speed 12 knots. (Shin Suisan Shimbun Sokuho, Japanese periodical, January 19, 1962.)

* * * * *

GOVERNMENT ASKS FOR MORE MONEY FOR FISHERY REGULATIONS ENFORCEMENT:

The Japanese Fisheries Agency is requesting 146,788,000 yen (US$408,000) in the 1962 budget (April 1, 1962-March 31, 1963) for fishery enforcement purposes. This represents an increase of 13,210,000 yen (US$36,700) over the 1961 budget.

The Fisheries Agency plans to operate seven 450-ton-class patrol vessels and one 150-ton vessel to patrol the salmon fishery; assign 7 inspectors to the mothership-type king crab fishery, 24 inspectors to the mothership-type salmon fishery, and a total of 10 inspectors to the Eastern Hokkaido land-based salmon fishery and the Japan Sea pink salmon fishery.

In addition, the Agency plans to arrange to have landings in Japan of salmon processed by the salmon motherships inspected at time of landing, like last year, and station 5 inspectors at the fish ports--Kushiro, Nemuro, Akkeshi, Miyako and Hachinohe--which have been officially designated as ports of landing for the Eastern Hokkaido land-based salmon fleet. (Shin Suisan Shimbun Sokuho, January 19, 1962.)

* * * * *

GOVERNMENT LOANS FOR PROMOTION OF EXPORT TRADE:

The Japanese Ministry of International Trade and Industry (MITI) reportedly plans to increase and expand the export loan program to include exporters associations, importers associations, and import-export associations for the purpose of promoting export trade, according to a translation from the Japanese periodical Suisan Keizai Shimbun, January 24, 1962. To implement this program, MITI plans to submit a bill calling for the partial revision of the Commerce and Industry Central Banking Law at the next session of the Diet, whereby exporters associations, importers associations, and export-import associations will be included in the category of organizations eligible to receive financial assistance from the Commerce and Industry Central Bank. Organizations engaged partly in export and/or import but which are not identified as such by name will not be eligible for aid under this program.

Approval of this program has already been received from the Democratic-Liberal Party and MITI hoped to submit it to the Cabinet in January prior to presenting it to the Diet.

Agricultural and fisheries products will naturally be affected by this program, the implementation of which will mean that eligible associations engaged in handling agricultural and fisheries products will now have two sources of funds available to them during periods of depressed business conditions, the other being the Agriculture and Forestry loan fund. For this reason, MITI expects an expansion of trade in agricultural and fisheries products.

* * * * *

MORE MONEY FOR SALES PROMOTION OF FOOD PRODUCTS:

The Agriculture and Forestry Committee of the Japan Export Trade Promotion Association (JETRO) held a special meeting in Tokyo on January 26, 1962. The Committee reported on its trade promotion activities in 1961 for agriculture, forestry, and fishery products and discussed the 1962 budgetary requirements for promoting exports of those products, according to a translation from the Japanese periodical Suisan Keizai Shimbun, January 28, 1962.

It was stressed that as a result of the Government's policy to promote the national economy, demand in 1961 for canned tuna and frozen tuna continued good as evidenced by conditions in the United States, and the market remained stable. However, the strong demand for fish sausage and fish ham in Japan, coupled with shortage of raw materials for those products (of which tuna is one) has served to restrain exports of tuna. Also

Japan (Contd.):

high prices paid on the domestic market for raw tuna as a result of a strong demand for canning purposes may throw tuna export prices out of balance in the future. Bearing this in mind, JETRO plans to step up its overseas publicity activities in 1962 and hopes to ask the Government to give special consideration to the procurement of raw materials for the production of canned tuna.

JETRO plans to drastically increase its publicity expenses for 1962 to 41,114,000 yen (US$114,000), an increase of 19 million yen ($53,000) over the previous year's expenditures. Of that amount, JETRO plans to spend 10 million yen ($28,000) for publicizing pearl products and 24,250,000 yen ($67,000) for publicizing Japanese canned tuna and tuna-like products for export to the United States and, as a new undertaking, spend 5 million yen ($14,000) for pearl publicity in West Germany. The remainder of the fund would be used for publicizing Japanese fresh fruits in Hong Kong, Europe, and the United States.

日本

Malaya

JOINT JAPANESE-MALAYAN TUNA CANNING OPERATION AT PENANG:

The joint Japanese-Malayan tuna fishing and cannery operation at Penang, Malaya, is small and at present is operating in leased quarters. It is reported to be running at a loss. However, it has plans to build its own cannery and to expand production.

Fifty-one percent of the capital of the firm is Malayan, and the remainder is Japanese. The company was organized in 1959 with pioneer status from the Government of the Federation of Malaya. The firm began operations in February 1960. The company leases two canning plants; one is shared by another canned food company and the other is shared by another company. The refrigeration unit is owned by the tuna canning firm.

The tuna used by the cannery are caught in the Indian Ocean by a fleet of 4 Japanese fishing vessels, 2 of which are 100 tons, and the others are 150 tons. The former bring in catches of about 50 tons per vessel, and the latter about 80 tons. Approximately once a week one vessel will return to Penang with a catch. Three types of tuna are caught: albacore or white-meat tuna, yellowfin, and big-eyed; both of the latter are light meat. The average weight of the fish is 80 pounds. In addition, spearfish as well as black, white, and striped marlin are caught, but these are not canned nor is there any demand for them in Penang, so they are shipped to Japan.

Aboard the fishing vessel the fish are stored in refrigerated holds. The hatches are opened and the fish are hauled out in groups and swung over to the pier where the vessel is docked. The fish are hosed. A team of young men then drag the tuna over to be weighed and loaded on to trucks. The trucks take the fish over to the refrigeration warehouse of the canning firm.

The tuna are stored in 3 refrigerated rooms where there is space for 200 long tons of fish and where the temperatures of the rooms are kept at -20 and -25° C. (-4 and -13° F.). These rooms are also used for the storage of saurles (fish of the sardine family) used by the Japanese fishing vessels for bait.

Processing of the tuna for canning is as follows: the tuna are taken from the refrigerators and thawed. Then wedges of meat about 2 feet long, and 6 to 8 inches thick at the widest part, are cut off and placed in wooden frames with wire bottoms. These are placed in steam ovens for cooking. When the meat is cooked, it is removed from the ovens and allowed to cool. Then the bones, dark meat, and skin are removed, and the cleaned tuna meat is put through a slicing machine which cuts it into slices about an inch thick. These slices are passed to girls who then weigh 167 grams (about 5.9 ounces) of tuna meat and place it on metal plates. These are passed to another group of girls who put the meat into 7-ounce cans which are imported from Japan. At another table, 2 girls are putting tuna fish flakes into cans. The weight of the cans is then checked, and they are passed on to have 2.5 grams of salt added and to be filled with cottonseed oil or soybean oil, or sometimes with tomato sauce. Next, the cans are passed on to the operator of a machine which puts tops on the cans. The sealed cans are then steamed for 1 hour and 20 minutes at 7-lbs. pressure and at 112° C. (233.6° F.). After that, the cans are removed, cooled, washed, packed 48 to a case, and sent to a warehouse where labels are attached and the cans stored.

The two canning plants used by the canning firm are rented. One employs approximately 60 persons, and there is a Japanese technician in charge of canning, another in charge of the fish meal manufacture, and a third in charge of tuna-liver oil extraction. At the other plant there are about 52 employees, including one Japanese technician. Ninety percent of the company's employees are women. The local employees are mostly Chinese, but there are a few Malays and Indians.

At the refrigeration plant, there is one Japanese technician in charge of the cold rooms, supervising the work of 6 locals, and another Japanese technician is in charge of the refrigeration machinery and is training 3 locals (a Chinese, a Malay, and an Indian).

The total monthly output of the two canning units is 7,000 cases of 48 7-oz. cans. Five percent is canned tuna flakes and 95 percent is solid pack (4 chunks of meat to a can). In addition, the firm prepares 70 pounds of tuna sausage a day for local consumption. There is also half a ton of fish meal made each day, and this is sold for chicken feed. The fish meal sells for 23 to 24 Malayan cents (7 to 8 U.S. cents) a pound; the company plans to increase production to one long ton a day. Finally, the company produces a small amount of tuna-liver oil which can be added to the fish meal to enrich it, or it can be used in the manufacture of margarine.

At present the company exports its canned tuna to West Germany, Denmark, Austria, Switzerland, Holland, the United Kingdom, and Canada. In 1962 the firm hopes to start exports to the United States. There still is no market for canned tuna in Malaya.

According to the Deputy Manager Director, the firm is losing money. The reasons for this are, he said, the present unit of production is too small in comparison with the overhead fixed costs. In addition, both canning units are in leased buildings. The rents are high and the firm also has to pay all the utility charges for the premises even though only part of such utilities are used by them. Again, each of the 6 Japanese technicians is paid M$1,000 (US$333) a month. Each is on a 2-year contract, which is renewable. It is hoped that most of these technicians can be replaced with trained Malayans, but that will not be possible for a year or more.

The company plans to build its own cannery on the land adjoining the refrigeration unit and to increase production. The cannery and refrigeration unit will then occupy an area of 50,000 square feet. This would mean a considerable capital outlay, but it should also mean a substantial saving in overhead costs. (United States Consulate, Penang, December 22, 1961.)

Malaya (Contd.):

Fig. 1 - One of two canning plants leased by the joint Japanese-Malayan tuna fishing and cannery operation at Penang, Malaya. This is the one shared by another canned food company.

Fig. 2 - Japanese tuna fishing vessel Fuku Maru II that has returned from the Indian Ocean with a catch, alongside a pier in Penang.

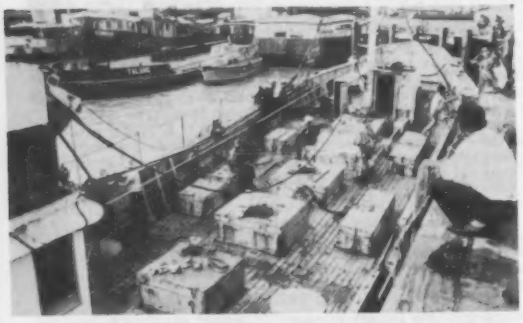


Fig. 3 - Japanese fishing vessel; looking toward the bow.

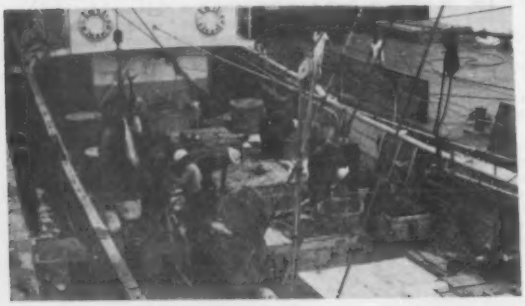


Fig. 4 - Tuna being taken out of the holds of Japanese fishing vessel.

Fig. 5 - Unloading tuna at a pier in Penang.

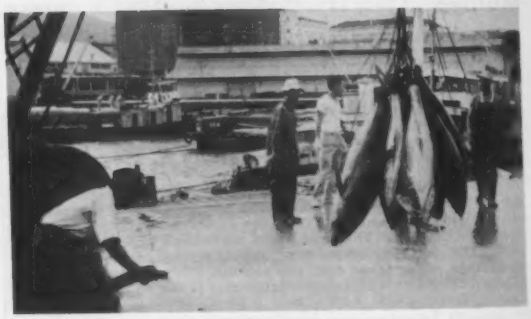


Fig. 6 - Tuna being hosed on pier before weighing.

Fig. 7 - Tuna being weighed.

Malaya (Contd.):

Fig. 8 - Steam ovens for cooking tuna at one of the canneries in Penang.

Fig. 9 - Tuna cooling after removal from steam oven.

Fig. 10 - After cooling, the bones, dark meat, and skin are removed from the cooked tuna.

Fig. 11 - Tuna meat being sliced before canning.

Fig. 12 - Packing tuna flakes into cans.

Fig. 13 - Cans are weighed before salt and oil is added to the tuna.

Fig. 14 - Adding salt to tuna.

Malaya (Contd.):

Fig. 15 - Sealer putting tops on cans. Japanese technician in the left supervises the work

Fig. 16 - Refrigeration unit for cold-storage plant.

Fig. 17 - Part of refrigeration machinery for cold-storage plant.

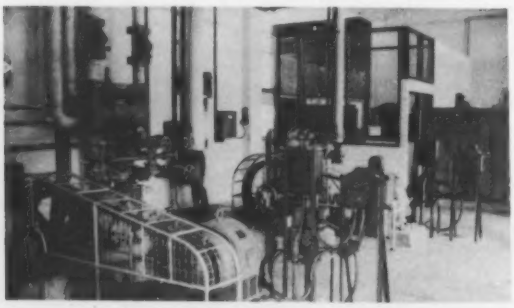


Fig. 18 - Inside control room of refrigeration room.

Mexico

SEVERANCE TAX CHANGED ON SOME SHRIMP PRODUCTS:

Mexican severance tax categories for beheaded cooked, dried peeled, and dried shrimp with shell on were eliminated in the same decree that increased the ad valorem duty on all imports of edible fresh, frozen, dried, or canned fishery products. The decree became effective January 1, 1962 (Diario Oficial, December 30, 1961).

This means that in the future shrimp falling in the categories mentioned above will pay severance taxes on the basis of fresh whole or fresh headless. In essence this means an increase in taxes on the beheaded cooked, dried peeled, and dried shrimp. However, only relatively small amounts of dried and cooked shrimp have been produced in Mexico in recent years. The bulk of the shrimp production in Mexico consists of fresh headless on which the severance tax is 22 centavos a kilogram (about 0.8 U. S. cents a pound). The severance tax on fresh whole or heads-on shrimp is 21 centavos a kilogram (about 0.76 cents a pound). (United States Embassy, Mexico City, January 18, 1962.)

* * * * *

IMPORT DUTIES ON EDIBLE FISHERY PRODUCTS INCREASED:

An additonal ten percent ad valorem duty has been placed by Mexico on all imports of edible fresh, frozen, dried, or canned fishery products. The funds derived from this tax, which is levied on many items other than fishery products, will be used to develop exports of locally-manufactured products. The higher rate of duty became effective January 1, 1962 (Diario Oficial, December 30, 1961).

It is not anticipated that this increase in duties will affect apreciably imports of fishery products from the United States since most of these are luxury items. Total Mexican imports of edible fishery products in 1960 were valued at about US$1.4 million of which less than $60,000 worth were from the United States.

The same decree also repealed the last paragraph of Article 5 of the Law of November 17, 1939, which provided for free sport-fishing permits in Baja California. Foreign non-residents of Mexico must now obtain li-

Mexico (Contd.):

censes for fishing in Baja California. The fees are nominal: 6 pesos (about 48 U. S. cents) for a three-day permit; 10 pesos (about 80 cents) for a one-month permit; 25 pesos (about US$2) for a three-month permit; 50 pesos (about $4) for a one-year permit. (United States Embassy, Mexico City, January 10, 1962.)

Nicaragua

SHRIMP FISHERY TRENDS:

The focal point of major shrimp fishing activities in Nicaragua shifted during the final quarter of 1961 from the East Coast to the Pacific Coast as a large United States firm operating out of Corinto put 30 vessels to fishing shrimp. These vessels were catching over 200,000 pounds of large shrimp each month as of January 1962. The United States firm is employing some 140 Nicaraguans and as of January had begun the installation of a freezing and packing plant.

Another Nicaraguan fishing company was organized during the quarter and will operate out of Puerto Somoza, also on the West Coast. Puerto Morazan (West Coast) fishermen again complained about Salvadoran fishing incursions.

Operations at Casacrus on the East Coast reportedly picked up in December 1961.

Total 1961 shrimp exports from Nicaragua totaled about 900,000 pounds valued at $475,000. In 1960 shrimp exports totaled only 515,000 pounds. (United States Embassy, Managua, January 25, 1962.)

Norway

DISMAL PROSPECTS FOR WINTER HERRING FISHERY:

January reports from Aalesund, main fishing port in West Norway, indicate that predictions of another poor winter herring season are all too true. Aalesund, which in late January used to be teeming with fishermen, showed few signs of activity this year. Crews for herring vessels are in short supply. With prospects of a fair catch none too promising, many fishermen have switched to other types of work. Others have obtained jobs on fishing vessels which presently are landing sizable quantities of herring in the Lofoten waters of North Norway. This is a new development, for Lofoten has traditionally been known mainly for its cod.

Just how many fishing vessels will be on hand for the long overdue start of the West Norway winter herring season is difficult to say. Local experts guess that no more than about 150 purse seiners will take part. Five years ago, there were 599 purse seiners, besides 1,408 drift netters and 489 auxiliary craft, manned by a total of nearly 30,000 fishermen. Last year, only 254 purse seiners and 789 drift netters showed up, while the number of auxiliary craft dropped to 147.

With further reductions expected this year, hardly more than some 10,000 men are likely to try their luck in the herring fishery off the coast of West Norway. Thus, over a period of five years, altogether some 450 purse seiners and 400 auxiliary craft, plus about 700 drift netters, manned by altogether 20,000 fishermen, have quit the once so profitable herring fishery.

In the same period, the first-hand or ex-vessel value of the herring catch has dropped catastrophically from Kr. 260 million (US$36.5 million) to slightly over Kr. 18 million ($2.5 million) last year. Operators and fishermen, at first staggered by the turn of events, have adjusted surprisingly well to the fact that for the present, at least, the abundant herring harvest is a thing of the past. The herring meal and oil processing industry, too, has managed to survive by and large.

Rather than wait for the western herring fishery to pick up, many operators have diverted their vessels to different waters. Quite a few have found profitable fishing grounds in the North Sea. Others are doing well off the Finnmark coast, where landings of herring and caplin have shown a notable increase in the past several years. As of January 1962, some 150 vessels were fishing for cod on the Halten Bank, some 50 nautical miles off North Trøndelag. Enterprising fishermen from the Sunnmøre district were making good catches off the Faroe Islands. Fishing for porbeagle in the North Atlantic has also proved rewarding for some.

Meanwhile, prospects for the West Norway winter herring fishery are the most dismal in many decades. A year ago, ocean researchers said that, granted reasonably fair weather, the total quantity might reach about 200,000 metric tons. However, fierce storms raged during the better part of the season, with the result that fishermen landed only slightly over 69,000 tons, as against more than 300,000 tons in 1960. On the eve of the 1962 season, researchers cautiously warn that the weather will have to be much better than last year to manage a catch of about 100,000 tons. The quantity of mature herring coming to spawn on the coastal banks this year is estimated to be 25 percent smaller than it was a year ago. Next year, however, the fairly plentiful crop of herring spawned in 1959 should help to increase the influx of mature fish. (News of Norway, January 25, 1962.)

* * * * *

FISH FINDER HAS LIMITED USE IN TUNA FISHERY:

Norwegian research in the use of the fish finder ASDIC in tuna fishing began in the 1960 season. The purpose was to determine whether ASDIC could be used in the tuna fishery. The herring ASDIC was used. The preliminary results can be summarized as follows:

Schools of tuna give echoes, but it has not been possible to distinguish any special characteristics of the echo. It is difficult, there-

Norway (Contd.):

fore, to determine whether an echo derives from tuna or from other school fish, if one does not see the fish at the surface. The range of an echo from fish at the surface is about 2,300-2,600 feet. If the tuna break the surface, an observer can see them at a much greater distance. When the fish "striper" (fishermen's term which means tuna barely break surface), it can often be difficult to see them.

The value of ASDIC in the tuna fishery seems to be limited because echoes from other school fish, which naturally enough are abundant where tuna feed, dominate the echogram. The best fishing grounds for tuna off Western Norway (Vestlandet) in 1960/61 yielded a strong interfering bottom echo due to the uneven bottom conditions.

Because of these experiences, it was concluded that the value of ASDIC for expanding the tuna fishery seems to be greatly limited. Meanwhile it must be stressed that all parts of the problem have not been adequately investigated. Tests were not made continuously throughout the entire season, and were limited to the fishing grounds between Bulandet and Espevaer. The experiments will continue, therefore, in 1962, and it is hoped the fishing grounds in Northern Norway may be tested also. (Translated excerpt from the "Report of the Tuna Cruise of M/V Thor Iverson," August 2-September 7, 1960. Original article appeared in the January 25, 1962, Fiskets Gang, Norwegian periodical.)

Peru

FISH MEAL INDUSTRY TRENDS:

At the end of 1961, the official count of enterprises in the fisheries manufacturing industry (freezing, canning, salting, fish meal and fish oil) was 129 companies operating 269 processing plants (114 of them producing fish meal).

Fish meal production and exports continue to constitute the major activity of the industry. An estimate of Peru's fish meal production for 1961 of 640,000 metric tons, made in November by the Fisheries Service of the Ministry of Agriculture, was somewhat lower than the 680,000 to 700,000 tons estimated earlier by the industry.

Data have not yet been made available on fish meal exports for 1961. When released, they are likely to show a considerable increase over the 600,000-ton quota originally assigned to Peru by the international fish meal producers group.

As the new year opened, Peruvian producers were anticipating somewhat higher production than last year, but as of the end of January persistent early morning fogs had hampered anchoveta fishing. Also a week's strike of fishermen in Chimbote was expected to reduce January production. Also a short strike by truckers and a Government decree closing 33 plants in Chimbote on February 1 because of the odor problem further curtailed fish meal production. But information early in February indicated the labor disputes had been settled and plants were operating again. As of the first part of February fishing continued poor.

The situation apparently influenced the fish meal marketing organization (Consorcio Pesquera del Peru, S.A.) to announce that it temporarily would not accept new orders, since those on hand were expected to exhaust available supplies. The organization was to reassess the situation from time to time, in order to maintain a reasonable balance between total supplies and total sales. Meanwhile, world demand for fish meal is said to be rising and prices to be holding up well. (United States Embassy, Lima, report of January 30, 1962.)

* * * * *

MOST FISH MEAL PLANTS REPORTED SHUT DOWN:

The Consorcio Pesquera del Peru S.A. (marketing organization for fish meal producers) announced the first part of February 1962 that about 80 percent of Peru's fish reduction capacity has been curtailed due to (1) a series of strikes by truck drivers since January 1, 1962, (2) renewed fishermen's tie-ups effective January 29, and (3) a Government decree closing 33 plants at Chimbote on February 1 because of odor problems.

These developments have affected February delivery schedules of fish meal contracts with United States buyers to the extent that the Consorcio has declared "Force Majeure" (circumstances beyond control of seller). A later report states that these developments will also affect March delivery schedules.

* * * * *

Peru (Contd.):

FISH MEAL PLANTS OPERATING AGAIN:

Information received as of mid-February 1962 indicates that the labor disputes affecting truck drivers and fishermen in Peru have been settled. These labor disputes were affecting the production of fish meal. Also, the plants in Chimbote closed on February 1 by a Government decree because of odor problems are operating again, but fishing early in February was reported poor.

Philippines

GOVERNMENT'S ECONOMIC REFORM AFFECTS FISHERY PRODUCTS IMPORTS:

The Philippine Government announced that it would revise the dual exchange rate system by abolishing the official rate and establishing a single free rate of exchange, according to a translation from the Japanese periodical Suisan Tsushin of January 23, 1962. This means that decontrolled items, such as canned sardine and canned salmon heretofore imported into the Philippines under the official exchange rate, will hereafter be transacted under the free rate. So far as the effect on canned sardines is concerned, this measure virtually amounts to devaluating the currency and will inevitably push up the sardine market price. As a result, sales of canned sardines are expected to decrease. On the other hand, the Government's action will eliminate differences in exchange rate between canned sardines on the one hand and canned saury and canned jack mackerel on the other, which the Philippines have always imported under the free trade.

According to the Suisan Tsushin of January 26, the Japan Canned Foods Exporters Association received a detailed report regarding changes in the Philippine exchange rate. Gist of this report follows:

1. After January 22, all imports will be carried out under the free exchange rate (also referred to as the "floating rate").

2. The Philippine Government has provisionally discontinued levying the marginal tax and plans to formally abolish it in the future.

3. The Philippine Bank Association will establish the new free rate. Present outlook is that the exchange rate will fluctuate between 4 to 4.6 pesos for each US$1.

4. Import tariff rates will be drastically revised. Tariffs will be reduced for essential goods and increased for nonessential goods. The current 15-percent tariff on canned sardines and canned corn beef will be lowered to 8 percent; tariffs on canned saury and canned jack mackerel will most likely remain at the present rate of 15 percent.

5. Bond rate for importers was reduced from the previous 50 percent to 25 percent for decontrolled items, such as canned sardines, canned saury and canned mackerel, but was increased to 150 percent for nonessential goods.

Views of the Japan Canned Foods Exporters Association concerning the above economic reform carried out by the Philippine Government are essentially as follows:

1. Import duty on canned sardines has been lowered to 8 percent. Should canned sardines be imported into the Philippines at the new exchange rate of over 4 pesos to a dollar, as compared with the previous rate of 2.5 pesos to a dollar, the import price of that product would be about twice that of the former price. Sales of canned sardines will be slow until the new price gains consumer acceptance. At this time of the year, African fish canners are out of stock, but the confusion brought about in the Philippines by the currency reform virtually eliminates the opportunity of introducing Japanese products into the Philippines at this time.

The Philippine Government has issued new import licenses, but all earlier trade negotiations pending issuance of new licenses are expected to be cancelled.

2. Canned saury is no longer subject to the marginal tax and this has saved this product from becoming a completely hopeless trade item. However, the new tariff rate on canned sardines is 7 percent below that of canned saury, and canned sardines will now sell for about the same price as that for canned saury, although the import price of canned saury is presently 200 yen (55 U.S. cents) less per case than that for canned sardines. This does not make canned saury attractive to the Philippine buyers. Some hope could be held out for canned saury if the Philippine Government would reduce the tariff on that product to the same level as that for canned sardines. Even then, it would be extremely difficult for Japanese canned saury to compete pricewise with South African fishery products.

Portugal

CANNED FISH PACK, JANUARY-SEPTEMBER 1961:

Portugal's total pack of canned fish in oil or sauce for the first 9 months of 1961 was up 15.3 percent as compared to the same period in 1960. The sardine pack accounted for 70.2 percent of the total, followed by tuna (9.4 percent) and anchovy fillets (8.6 percent). There were substantial increases in 1961 in the packs of anchovy fillets, sardines (up 11.1 percent), and mackerel. There was a decrease of 12.6 percent in the pack of tuna.

Portuguese Canned Fish Pack, January-September 1960-1961

Product	January-September			
	1961		1960	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines	29,651	1,561	26,677	1,404
Chinchards	1,987	104	1,770	94
Mackerel	2,766	110	410	16
Tuna and tuna-like	3,957	140	4,525	162
Anchovy fillets	3,638	364	2,666	267
Others	211	11	545	29
Total	42,210	2,290	36,593	1,972

During the first 9 months of 1961 sardine landings in Portugal totaled 69,164 metric tons. The bulk of the sardines landed are used for canning. Of the other species used for canning, there were landings of 1,614 tons of tuna, 108 tons of bonito, 4,123 tons of mackerel, 7,344 tons of anchovies, and 30,038 tons of chinchard. (Conservas de Peixe, November 1961.)

* * * * *

Portugal (Contd.):

CANNED FISH EXPORTS, JANUARY-SEPTEMBER 1961:

Portugal's exports of canned fish during the first 9 months of 1961 were 16.6 percent more than in the same period of 1960. Sardines accounted for 81.0 percent of the 1961 exports, followed by anchovy fillets with 7.6 percent, and tuna with 5.4 percent. In 1961, exports were up 13 percent for sardines, 16 percent for tuna, and 29.1 percent for anchovy fillets as compared to 1960.

Portuguese Canned Fish Exports, January-September 1961

Product	January-September			
	1961		1960	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines	40,281	2,120	35,654	1,876
Chinchards	1,733	91	1,135	60
Mackerel	1,060	42	378	14
Tuna and tunalike	2,689	96	2,318	83
Anchovy fillets	3,770	377	2,920	291
Others	186	10	243	12
Total	49,719	2,736	42,648	2,336

Portugal's principal canned fish buyers during the first 9 months of 1961 were Germany with 11,097 metric tons, followed by the United States with 5,667 tons, United Kingdom with 5,345 tons, Italy 4,249 tons, France 3,379 tons, and Belgium-Luxembourg 3,097 tons. (Conservas de Peixe, November 1961.)

Spain

TUNA FISHING INDUSTRY:

The summer tuna fishing season in Spain ended in October 1961 with a catch some 10 to 15 percent below that of the previous year in quantity. But because of higher prices, the value was the same.

Between the end of the summer tuna season and the beginning of the anchovy season in March, local fishing largely is limited to sea bream ("besugo"), round pompano ("palometa"), and mackerel. During the fourth quarter of 1961 the catch of those species was very light, with round pompano practically nonexistent and with sea bream making its appearance only after the first week of December. Consequently, wholesale prices of those species rose about 20 percent over the previous year.

Given the now perennial scarcity of fish in local waters during the winter months, it has become customary for the larger fishing vessels of Vizcaya to go to the South Atlantic to fish tuna until the spring or summer. This winter 16 vessels (2 more than last year, but 3 less than the 1959-60 record) with 350 crew members entered into a contract with a large California tuna canning firm. The contract is for 3 months from the beginning of December 1961 and it may be renewed on mutual agreement for another 3 months. The vessels were to make Freetown, Sierra Leone, their base until the end of December when they would transfer their operations to Abidjan Ivory Coast. Reports indicate that the catch by those vessels as of early January, 1962 has been good--some 933 metric tons of lower-grade tuna ("serrucho") during the 22 fishing days of December--and that facilities for receiving the catches on shore are better than last year.

Undoubtedly in imitation of the Vizcayan tradition, some 100 other vessels from various ports in the district have gone to Algeciras or other nearby Spanish ports to fish for "melva" (similar to tuna) in nearby Atlantic and Mediterranean waters. There have been reports of disappointment, and some of the vessels have returned.

There is considerable concern with the need to modernize the fishing fleet and to increase the cold-storage capacity of both the fleet and shore installations. Reports of plans to build long-range tuna vessels with cold-storage facilities have been circulating, but realization of such plans seem to be awaiting a more generous flow of ship construction credits which may occur in early 1962. (United States Consulate, Bilbao, January 8, 1962.)

Sweden

HERRING BONING MACHINE:

A British firm in 1961 received a Swedish-built machine for the beheading, tailing, and filleting of herring. Fish from $6\frac{3}{4}$ to 13 inches (17 to 33 cm.) in length can be handled. Only one operator is required, who should be able to put through about 60 herring per minute.

The machine is provided with a feed table on which there is a single enclosed knife. The fish is held against the knife to remove the tail, and is then pushed forward to be caught by one of 4 rotating arms which pushes the fish on to a circular knife, removing the head. The herring then follows a groove down the feed table to be caught between 2 rubber belts, which convey the fish under 2 horizontal knives. The belly is cut, and then the fish is gutted by a rotating pulley. Rotating knives further remove the back and side-bones leaving 2 connected fillets. The machine may be adjusted to leave single fillets. Constant flushing removes all residue, and once the operator has held the fish against the first knife for trimming the tail, his hands are free to deal with the next fish. (Food Processing and Packaging, vol. 30, no. 62 (1961), p. 353.)

Taiwan

FISHERY LANDINGS CONTINUED TO INCREASE IN 1961:

Taiwan's fishery landings in 1961 reached 312,439 metric tons as compared to 259,140 tons in 1960. They exceeded the 1961 target of 270,000 metric tons by over 42,000 metric tons. The large increase was the result

Auctioning of tuna in the Kaohsiung Fish Market, Taiwan.

of (1) unusually good catches of sardines and moonfish, (2) an increase in the number and tonnage of fishing vessels, and (3) fair fishing weather.

Taiwan's Fishery Landings, 1957-61

Type of Fishery	1961	1960	1959	1958	1957
	(Metric Tons)				
Deep-sea	106,147	85,210	76,411	61,160	52,223
Inshore	117,405	94,856	91,240	81,720	71,552
Coastal	31,533	30,044	32,183	38,267	38,468
Fish culture	57,354	49,030	46,493	48,530	45,878
Total	312,439	259,140	246,327	229,677	208,121

* * * * *

NIGHT FISHING WITH PURSE SEINES SUCCESSFUL AT SUAO:

From the important inshore fishing port of Suao, fishermen tried night fishing with purse seines. Using fish finders to locate the fish and mercury lamps to bring the fish schools to the surface, both supplied by the Joint Commission on Rural Reconstruction (JCRR), one pair of purse seiners caught 30 tons of moonfish in one night. Other fishermen followed suit with the result that the catch of moonfish in 1961 was the biggest ever made in Taiwan.

* * * * *

LOAN FOR CONSTRUCTION OF TUNA LONG-LINERS:

The JCRR extended a loan for the construction of 12 145-ton long-liners in 1961. The boats as of February 1962 were under construction in shipyards in Taiwan and were expected to be available for use early in 1962. They will operate from the port of Kaohsiung and are expected to add about 5,000 metric tons of tuna to the Island's fish catch. Taiwan's 1961 export of frozen tuna amounted to 1,116 metric tons valued at US$347,679.

All articles under Taiwan are by
--T. P. Chen, Chief, Fisheries Division,
Joint Commission on Rural Reconstruction,
Taipei, Taiwan.

Note: See Commercial Fisheries Review, April 1962 p. 85.

U.S.S.R.

FISHERY CATCH SETS NEW RECORD IN 1961:

The Soviet Union's 1961 catch of 3.7 million metric tons exceeded the record 1960 catch of almost 3.1 million tons.

Fig. 1 - Russian fishery factorship operating in Bering Sea. Home Port, Bladnoctok.

It was admitted, however, that this catch "still far from satisfied the population's present demand" for fish, and that the composition of the catch leaves much to be desired. The gross catch figure includes "a certain quantity" of nonfood species as well as an oversupply of "hors d'oeuvre" species--sprat, sardelle, khamsa (anchovy, Engraulis encrasicholus), etc., which have only a limited demand. On the other hand, the catch of fresh

U. S. S. R. (Contd.):

Fig. 2 - Two Russian fishing trawlers operating in Bering Sea. Approximate length 70 feet.

water species, which have a "basic demand" (i.e., pike, sazan or wild carp, carp, bream, sheatfish, etc.), and "by the availability of which the population judges the works of the fish industry," has decreased somewhat in recent years. (Translation from Rybovodstvo i Rybolovstvo, No. 1, 1962.)

Note: See Commercial Fisheries Review, February 1962 p. 94.

United Kingdom

EXPORT COMBINE FORMED BY TEN LEADING FISH PROCESSORS:

Ten leading British fish-processing and quick-freezing firms, all headquartered in the Hull-Grimsby area, have combined in a drive for the export of frozen fish in "catering" packs, according to a January 2, 1962, announcement. The combine has taken over the name of a firm formed four years ago when two firms joined forces to sell frozen fish to Eastern Europe. Substantial exports of frozen fish to Iron Curtain countries have been made under the British label in the last four years from the fishing ports of Hull, Grimsby, and Fleetwood, Lancashire.

The registered office of the new export combine firm is at Grimsby, Lincolnshire, and each of the ten firms has a representative on the main board of the company. In addition, day-to-day administration is carried out by a committee of four.

The Chairman of the new combine states that the organization has been set up to counter "the nationally organized fishing industries of other countries."

The company works closely with the British Trawlers Federation, which is attempting to develop a world market for British fish. Bulk purchasing of all raw materials, streamlining of administration, and centralization of sales effort will, it is anticipated, stabilize marketing. Stringent quality control specifications for products have been laid down and plants of member firms will be inspected regularly to see that these standards are being observed.

In the first year, the organization anticipates total shipments of frozen fish to be about 10 million pounds, worth about £750,000 (US$2,100,000). The principal markets aimed at will be Eastern Europe (all types of fish) and Australia (sea bream). The home market for sea bream has been disappointing, but small-scale exports from Hull to Australia during the summer of 1961 have given members of the trade an opportunity for testing the overseas market. A Hull spokesman said "There are very substantial sales of bream in Australia and we are hoping to develop them." (United States Consulate, Manchester, England, January 4, 1962.)

* * * * *

UNDERWATER REMOTE CONTROL CAMERA DEVELOPED TO STUDY FISH BEHAVIOR:

A simple self-contained camera and flash unit, using dry batteries and operated by a clockwork timer, which can take about 200 exposures at preset intervals (actually 1-minute and 3-minute intervals have been used) has been developed by the Scottish Home Department Marine Laboratory at Torry, Aberdeen.

The camera has been used in two ways: (a) Attached near the headline of a trawl, so as to photograph the groundrope, or the zone immediately in front of it. The first sets of results, in depths up to 65 fathoms, confirm frogmen observations that fish in that region are normally swimming away from the groundrope and are therefore aware of the fishing gear. These observations will be continued to determine more exactly the influence of depth and light. (b) Placed on a heavy tripod and left on the sea-bed for subsequent recovery by means of a buoy rope. When used in this way there is less chance of fish being disturbed from their normal behavior than when the camera is swinging below a vessel. A first set of experiments was made using this technique in March 1960 on Ballantrae

United Kingdom (Contd.):

Bank, in the Firth of Clyde. This technique showed that most of the fish then present near the bottom were herring, that their numbers and schooling pattern on that occasion did not vary with the time of day or night, and that the fish were present in small schools of 12 to 20 fish. A local population density of about 2,000,000 fish/sq. mile was estimated from the known lens angle and limits of visibility. (Nature, vol. 188 (1960) p. 333.)

* * * * *

INFORMATION ON LONDON TRADE CENTER AND BRITISH FOOD FAIRS FOR EXHIBITING U. S. FISHERY PRODUCTS:

The United States Trade Center in London has good facilities for a commodity exhibit. It is located in the neighborhood of Piccadilly Circus at 57 St. James Street, London, S.W.1.

The next food exhibition is for fruit in late October or early November 1962. Since fruit may not need the full month allotted, it might be possible for fish to utilize the latter part of the allocated time. The next general exhibition for food is planned for about March 1963, unless the fruit plans fall through, in which case the general food exhibition might be moved up in its place. Fish, of course, could participate in the general food exhibition.

Exhibitions at the U. S. Trade Center provide excellent publicity, a presentation of products to buyers, and an opportunity to make sales. At the American Food Exhibition at the Center, September 6-22, 1961, about 2,000 trade representatives attended. A sample check of exhibitors indicated all would participate again. Freeze-dried shrimp, as a new and unique United States product, was the hit of the show. Exhibitors of this product found participation in the food exhibition very helpful in introducing their product to a great number of trade people quickly and at little cost.

The U. S. Trade Center offers no special facilities for showing films but they could be shown at luncheons. Tie-ins between fish and agricultural products might be arranged, for example, fish and rice. Exhibition at the Trade Center would reach representatives interested in both the home consumption market and the large catering or institutional trade. When their imports are on display, London trade circles usually cooperate by having local sales representatives at the exhibits.

From May 8 to 20, 1962, there will be the 30th annual Grocery Fair at Manchester. It will have food exhibits from the United States for the first time. Six other countries also will be represented. The location is in the Midlands, not far from the import center of Liverpool, and in a large industrial food consuming area. Grocery Manufacturers of America are to handle the United States food exhibits in a self-service food store where foods can be purchased. Fish could be exhibited.

The British Food Fair in London will run from August 22 to September 12, 1962. It is larger than the Manchester fair. Grocery Manufacturers of America plan to use the same exhibit as at Manchester with appropriate changes. In general these fairs will offer (1) an opportunity to display products, and to sell them in a self-service market in the case of the GMA exhibit, (2) a demonstration area for commodity groups--e.g., canned fish--where there can be sampling, demonstration of recipes, etc., and (3) a trade lounge where contacts can be made with buyers and trading conducted.

If participation were considered for either of the latter two fairs, the pattern of other successful efforts might be followed. This would include having a United States home economist available to supervise demonstrations, and a person familiar with United States processing and the products. A person familiar with fish products is required to handle the exhibit and those inquiries relating to products for which there are no British representatives, for example, for those United States packers seeking entry to the market and local representatives.

Eight representatives of London fish trade circles were interviewed. Represented were importers of United States or other foreign products, importers of United States products sold under the United States label, and distributors of fish products in multiple stores. In general the interviews revealed:

The great proportion of canned fishery products consumed in the United Kingdom, especially salmon, is sold under 5 or 6 national brands. The owners of the brands may use fish from any one of several sources under one brand name. For example, a dominant salmon brand may contain salmon from the United States, Canada, or Japan. Thus, exhibiting in such a manner as to promote the United States salmon used in such a brand is difficult or impossible. The source of the salmon is not readily obvious to the consumer since the actual country source is not designated as such but in general terms such as "empire packed" for Canada and "foreign packed" for the United States. So it does not help to ask the consumer or buyer to look for a U. S. source on the label.

Nor is it effective to push the national label itself because such promotion would also aid the Canadian and Japanese products used under the same label. In fact, since those products supply a greater share of the market they would be aided to a greater degree. Those interviewed were unanimous in agreeing that exhibiting at trade fairs by packers of United States salmon which were distributed under the dominant national brands would be an ineffective procedure. It is less true for other United States canned fish products, some of which are distributed under United States brands.

All agreed that if U. S. fish were sold in Britain under a U. S. label, exhibiting the product at food fairs was a type of promotion which would be helpful. However, they pointed out that substantial advertising in various media, competitive quality and prices, and local stocks were more important in promoting sales.

All agreed, also, that if a U. S. product seeking to enter the British market, would be backed by advertising, be competitive in price and quality, and adequately stocked, exhibiting at a food fair would be helpful.

All agreed, further, that a U. S. product that was so unique or individual that it would maintain the U. S. identity, even though under a national label, would benefit from exhibition at a food fair. An example of such a product might be one produced by a U.S.-controlled process--freeze-dried shrimp, for example--or one for which the dominant or only source was the U. S.

There was fairly general agreement that the best way to promote U. S. canned fish in Britain under a U. S. label was to choose one of the half dozen or so large importers or buyers, who had good connections with the multiple store groups, as a British representative. Very substantial funds would have to be expended on advertising in all forms. Quality and prices would have to meet those of other sources. And substantial local stocks would have to be available. All emphasized this was a very costly process.

Salmon, shrimp, and crab seem to offer the best possibilities for exhibition. The current demand for each is good. Importers said there seemed to be little demand for canned oysters or clams and that an extensive publicity campaign probably would be needed to expand the market. The pilchard market is dominated by South Africa. Tuna moves very slowly. Most said the consuming public was slow to change and just did not seem to have much taste for tuna. U. S. salmon must compete with Japan, Canada, and Russia. Shrimp competes primarily with Norway, and crab with Russia and Japan.

At present, there is a good demand for salmon, shrimp, and crab of competitive quality and at competitive prices.

United Kingdom (Contd.):

The potential is materially affected by price and quality. There were several adverse comments on the quality of U. S. products. (Based on a report of a survey made in January 1962 by the Regional Fisheries Attache, United States Embassy, Copenhagen.)

* * * * *

FISHERY LOANS INTEREST RATES REVISED:

The British White Fish Authority announced that as a result of changes in the rates of interest charged to them by the Treasury, their own rates of interest on loans made as from December 28, 1961, are:

Fishing vessels of not more than 140 feet, new engines, nets and gear: on loans for not more than 5 years, $6\frac{1}{2}$ percent (increase $\frac{1}{8}$ percent); for more than 5 years but not more than 10 years, $6\frac{5}{8}$ percent (increase $\frac{1}{8}$ percent); for more than 10 years but not more than 15 years, $6\frac{7}{8}$ percent (increase $\frac{1}{4}$ percent); for more than 15 years but not more than 20 years, 7 percent (increase $\frac{1}{4}$ percent).

Processing plants: on loans for not more than 15 years, $7\frac{5}{8}$ percent (no change); for more than 15 years but not more than 20 years, $7\frac{1}{2}$ percent (no change).

The rates on loans made before December 28, 1961, are unchanged. (Fish Trades Gazette, January 6, 1962.)

Note: See Commercial Fisheries Review, January 1962 p. 64.

JAPANESE CROSSBREED SALMON AND TROUT

A new variety of fish has been developed by crossbreeding ocean salmon and fresh-water trout. The new breed was produced by a group of scientists in the Hokkaido Fishery Incubation Station, Japan.

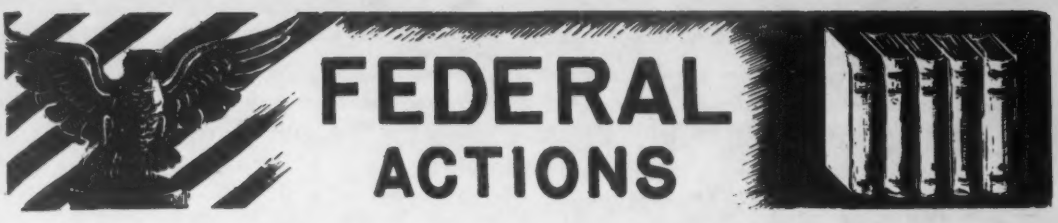
The creation of the new breed is significant in two ways. First of all, the newly-developed fish promises to be a species which will taste just as good as the ocean salmon the Japanese are so fond of. But more important, it can be spawned and raised in fresh water.

Salmon migrate during the spawning season to fresh-water streams in the Soviet Union, the United States, Canada, and Japan. When the young fish are hatched, they descend the streams and swim toward the sea. Since they were spawned in the rivers of various countries, it is hard to determine the various countries' respective fishing rights.

The new variety was developed by crossbreeding male ocean salmon with a fresh-water trout popularly known as the "sockeye" or blueblack trout. Scientists at the incubation station obtained 3,500 fish eggs from the fresh-water trout and put them into an experimental tank. Ocean trout were then released in the tank to fertilize the eggs. When the incubation period was over and young fish began to emerge, the scientists found that 50 percent of the eggs had been successfully incubated.

The crossbreeding proved to be a success and the newly-hatched fish can live in fresh water. When fully developed, the fish are expected to grow larger than trout, which normally attain a length of about 38 cm. (15 inches). A great number of "sockeye" trout is now being raised in the fresh water tanks that abound in Japan. Trout will eventually be used to provide the eggs for the development of the new salmon-trout breed of fish.

The development of a new variety of fish which can thrive in fresh water may be called a sort of ichthyological breakthrough. By developing the new breed of fish, a way has been opened toward the hatching of salmon-type fish in landlocked waters. (Japanese Information Office, Bangkok, July 1, 1960, and IPFC Current Affairs Bulletin, December 1960.)



Department of Commerce

AREA REDEVELOPMENT ADMINISTRATION

INDUSTRIAL LOAN TO FLORIDA CANNING FIRM APPROVED:

The Area Redevelopment Administration (ARA) of the U. S. Department of Commerce has approved a $652,135 industrial loan to a Florida fish canning firm. The loan will help provide more than 350 permanent new jobs in Apalachicola, Fla.

The loan, repayable over a 25-year period and bearing an annual interest rate of 4 percent, will be made to the Florida Seafood Canning Company, Inc. of Apalachicola. In addition to the money which is being borrowed from the Federal Government, a State group, the Industrial Development Corporation of Florida, will contribute $100,328 and the Florida Seafood Canning Company has raised $250,822.

The Department of the Interior investigated the feasibility of the Apalachicola Project, and the Small Business Administration negotiated the loan for ARA with the concurrence of the Community Facilities Administration. The project was also approved by the Florida Development Commission, the agency designated by Governor Farris Bryant to represent the State in redevelopment matters. This is in accordance with action taken by the Secretary of Commerce in delegating responsibility for key phases of the area redevelopment program to Federal and state agencies and departments in order to take advantage of existing Government facilities and to prevent duplication of effort.

The project will make possible the construction of a new fish processing plant, marine ways, machine shop, and the installation of machinery and equipment. The company will be processing seafood such as oysters, crab, scallops, shrimp, edible fish, and fish for animal diets.

Simultaneously with the loan for the construction of the processing plant, ARA is also making a public facility loan of $28,000 to the City of Apalachicola, repayable from revenue, to extend water and sewer facilities to serve the canning company.

Apalachicola is located in Franklin County, Fla., which was designated a redevelopment area eligible for participation in the area redevelopment program because of its substantial and persistent unemployment. The Apalachicola project came into being because of action on the part of the Apalachicola community to create local industry and new job opportunities by broadening the area's economic base. The 350 new jobs which will result from the ARA-assisted enterprise represent only the direct new employment at the Apalachicola processing plant. In addition, permanent employment will be created because of the firm's increased need for local services; other jobs will result in the service trades because of increased local purchasing power; and temporary employment will also be increased during the period of the construction of the plant.

Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

STANDARD OF IDENTITY FOR FISH FLOUR APPROVED:

A standard of identity for fish flour or fish protein supplement was approved on January 24, 1962, by the U. S. Food and Drug Administration. The standard requires that fish flour be made from cleaned fish after discarding the heads, tails, fins, viscera, and intestinal contents. The notice of approval appeared in the January 25, 1962, Federal Register. The order becomes effective on April 25, 1962.

The Commissioner of the Agency issued the following statement concerning the action:

"The Food and Drug Administration has completed study of almost 2,000 comments received on a previously published proposal to establish a standard of identity and thus legalize the marketing in the United States of a 'whole fish flour' made by grinding and drying entire fish of various sizes and varieties. During informal discussions before the proposal was submitted, we had expressed the opinion that such a product would be classed as filthy and thus illegal under the terms of the Federal Food, Drug, and Cosmetic Act because of the inclusion of the heads, tails, fins, viscera and intestinal contents. Proponents of the product, however, had maintained that we were not properly interpreting consumer understanding of the term 'filth.' For this reason the proposal for a standard was published, inviting all to express their views in the public record.

"Of the several hundred individual consumers and groups representing consumer interests who wrote, most opposed the adop-

tion of the proposed standard because the article was to be made from fish which had not been cleaned to remove those portions not customarily regarded in the United States as suitable for human food. Members of the food industries objected to the proposal on the grounds that legalization of such a product would adversely affect public confidence in commercially prepared food products now being made from clean, sound, wholesome ingredients under sanitary conditions. Many State and local food control agencies expressed the view that the product as described in the proposal would be classed as in violation of State and local laws.

"The proposal was strongly supported by firms and individuals connected with the fishing industry, many of whom frankly stated that authorization for this product as human food in the United States would be of great economic benefit to that industry and its employees. Others who favored the proposal pointed out that the product would be an excellent source of protein available at a low price for shipment to the underdeveloped countries of the world.

"Under the present terms of the Food, Drug, and Cosmetic Act it is entirely legal to prepare such a whole fish flour in the United States for export to any country in the world the laws of which do not prohibit that product. It is not unusual to encounter situations where a food entirely acceptable to the people of one country is not authorized for sale in others. This works both ways, in that certain countries prohibit the marketing of certain foods which are readily available and legal in the United States.

"While some have suggested that the 'whole fish flour' be so labeled that American consumers could choose or reject it, as they desire, this would not resolve the problem, since whole fish flour would not be eaten 'as is.' It would be used in preparing foods in factories, restaurants, and the like.

"As a result of consideration of all the available facts and opinions, the Food and Drug Administration is publishing an order which establishes a standard for 'fish flour' but requires that this be made from the cleaned fish after discarding the heads, tails, fins, viscera and intestinal contents. A product meeting this standard would be legal for shipment within the United States.

"Anyone adversely affected by the order has 30 days in which to file objections, with reasonable grounds, calling for a public hearing. If such a hearing is held, its results and the record of testimony taken will be subject to review by the United States Circuit Court of Appeals."

The order as published in the Federal Register follows:

Title 21—FOOD AND DRUGS

Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare

SUBCHAPTER B—FOOD AND FOOD PRODUCTS

PART 37—FISH; DEFINITIONS AND STANDARDS OF IDENTITY; STANDARDS OF FILL OF CONTAINER

Fish Flour; Identity

In the FEDERAL REGISTER of September 15, 1961 (26 F.R. 8641), there was published a proposal for a standard of identity for fish protein concentrate, whole fish flour as submitted by Mr. Harold Putnam of Washington, D.C.

During the 60-day period thereafter, the Hearing Clerk of the Department of Health, Education, and Welfare received over 1,800 comments on the published proposal. Of the several hundred received from individual consumers who were opposed to the proposal as published, many specifically stated that they would class the article as filthy because of the use of the entire fish. In addition to comments from consumers and groups representing consumer interests, views were received from many connected with various food industries. A great many communications came from firms and individuals identified as being associated with the fishery industry and, with few exceptions, these favored the adoption of the standard as proposed. The view was repeatedly expressed that the adoption of the standard would be economically helpful to the fishing industry. Many of the comments favoring the proposal did so on the basis of the view that the nutritive value of the article described was such that it should be made available to those individuals in other countries suffering from a deficiency of protein in their diet. Only a few letters suggested or implied that the diet of the American public, generally, is deficient in protein or needs supplementation with a whole fish flour.

Officials charged with the enforcement of 21 State food laws opposed the proposed standard on the grounds that such a product would be in conflict with the laws of the States because of the inclusion of filth; some also stated that, in their view, such a product should be classed as adulterated under the Federal Food, Drug, and Cosmetic Act.

Bakery groups, a number of individual bakers, and some other food manufacturers opposed the proposal as published on several grounds. They referred to the high standards of cleanliness in their industries, their use of clean, sound, wholesome ingredients and expressed the

view that any official authorization of a whole fish flour, which they regarded as filthy, would have an adverse effect on public confidence in commercially prepared foods, and would significantly defeat effective law enforcement, local, State and Federal, in preventing the marketing of filthy foods and foods prepared under insanitary conditions.

Comments received came from more than half of the 50 States. In addition to firms in the United States indicating interest in manufacturing such a product, one comment was received from a producer of whole fish flour in Sweden stating that the firm has marketed most of its output principally for inclusion in a Swedish type of enriched bread. That firm contemplated that if the standard is adopted, it would be interested in marketing the product in the United States.

A few comments, including the one from the Swedish manufacturer, suggested some changes in the specifications of the proposed standard. These dealt with proposals to increase the moisture content, increase or decrease the protein content, increase or decrease the permitted ash content, and increase the bacteria limit. However, these comments furnished insufficient data to demonstrate that the changes advocated would promote the interests of consumers.

In view of section 402(a)(3) of the Federal Food, Drug, and Cosmetic Act, which states "A food shall be deemed to be adulterated if * * * it consists in whole or in part of any filthy, putrid, or decomposed substance, or if it is otherwise unfit for food," the Commissioner was particularly interested in learning the views of those who commented on the question of whether they would be willing to eat foods containing a whole fish flour so manufactured.

Seven hundred and thirty six of the comments clearly opposed establishment of the proposed standard. One hundred and sixty-six of these specifically referred to their objection to the inclusion of viscera, heads, intestinal contents, etc., on the basis that they would regard the finished product as filthy. Of the 1,036 comments in favor of the standard as proposed, including the many duplicates signed by different individuals, only 17 specifically stated or strongly implied that they would be willing to eat such a product.

Therefore, on the basis of the information before him, the Commissioner finds:

1. That consumers in the United States generally would regard the product described in the proposal as filthy. Thus, such a product would be in conflict with section 402(a)(3) of the Federal Food, Drug, and Cosmetic Act.

2. That is would not promote honesty and fair dealing in the interest of consumers to establish a standard of identity for a whole fish flour containing those portions of the fish which would be regarded as filthy by American consumers generally.

3. That it is apparent from the information available that many persons who advocate the establishment of the proposed standard are concerned with the reported need for a source of good protein by people in underdeveloped countries of the world where local food supplies and raw materials are inadequate to supply that need. To the extent that such a need for a product as described in the proposal exists in countries other than the United States, section 801(d) of the Federal Food, Drug, and Cosmetic Act provides for the manufacture of such a product in the United States for export to any other country of the world, the laws of which do not prohibit that article.

4. That even though there is no evidence that there is a deficiency of protein in the diet of the people of the United States, a factor which would have no bearing on whether or not certain parts of fish in a ground product constitute filth, there appears to be a reasonable basis for establishing a standard of identity for fish flour prepared from properly cleaned and eviscerated fish.

Accordingly, it is concluded that it will promote honesty and fair dealing in the interests of consumers to establish a definition and standard of identity for fish flour, as hereinafter set forth. Therefore, pursuant to the authority vested in the Secretary of Health, Education, and Welfare by the Federal Food, Drug, and Cosmetic Act (secs. 401, 701, 52 Stat. 1046, 1055, as amended 70 Stat. 919; 21 U.S.C. 341, 371) and delegated to the Commissioner of Food and Drugs by the Secretary (25 F.R. 8625): *It is ordered*, That the following definition and standard of identity be established:

§ 37.5 Fish flour; identity.

(a) Fish flour is the finely ground, dried product made from edible species of fish. From the time of catching until the finished article is packaged the fish are handled expeditiously and with the sanitary precautions which are recognized as proper for fish which are used in other forms for human food. Before processing, the fish are properly prepared to remove and discard the heads, fins, tails, viscera, and intestinal contents. The cleaned fish are ground and treated to reduce the fat content of the finished fish flour to less than 1 percent. The product may be deodorized. The finished fish flour shall meet all of the requirements set out in paragraph (b) of this section.

(b)(1) *Protein content.* Protein content (N×6.25), measured by methods of the Association of Official Agricultural Chemists, shall not be less than 70 percent by weight of the final product (Official Methods of Analysis, A.O.A.C., 9th Ed. secs. 22.011; ch. 22, p. 285). Biological values of the finished fish flour shall not be less than 105 percent as measured by the official A.O.A.C. method for the biological evaluation of protein quality (secs. 39.133–39.137, inclusive, ch. 39, p. 680).

(2) *Moisture, ash and fat content.* Moisture, ash and fat content shall not exceed 6 percent, 25 percent and 1 percent respectively, by weight of the final product, measured by A.O.A.C. methods (secs. 22.003, 22.010, ch. 22, p. 283, 284; sec. 18.011–18.012, inclusive, ch. 18, p. 235).

(3) *Odor and taste.* The final product shall have no more than a faint fish odor and taste.

(4) *Storage stability.* Fish flour, after 6 months' storage at temperatures prevailing in areas of intended use (but not exceeding 38° C.) and when packed in metal containers or in polyethylene bags, shall show no spoilage as judged by the development of off-flavors, mold growth, production of toxic amines (histamine, tyramine), or by deterioration in protein quality.

(5) *Bacteria.* The product shall be free of Escherichia coli, Salmonella, and pathogenic anaerobes, and the total bacterial plate count shall not exceed 2,000 per gram.

(6) *Safety.* The finished product shall contain no food additive unless specifically authorized by regulation issued pursuant to section 409 of the Federal Food, Drug, and Cosmetic Act.

Any person who will be adversely affected by the foregoing order may at any time prior to the thirtieth day from the date of its publication in the FEDERAL REGISTER file with the Hearing Clerk, Department of Health, Education, and Welfare, Room 5440, 330 Independence Avenue SW., Washington 25, D.C., written objections thereto. Objections shall show wherein the person filing will be adversely affected by the order and specify with particularity the provisions of the order deemed objectionable and the grounds for the objections. If a hearing is requested, the objections must state the issues for the hearing, and such objections must be supported by grounds legally sufficient to justify the relief sought. Objections may be accompanied by a memorandum or brief in support thereof. All documents shall be filed in quintuplicate.

Effective date. This order shall become effective 90 days from the date of its publication in the FEDERAL REGISTER, except as to any provisions that may be stayed by the filing of proper objections. Notice of the filing of objections or lack thereof will be announced by publication in the FEDERAL REGISTER.

(Secs. 401, 701, 52 Stat. 1046, 1055 as amended 70 Stat. 919; 21 U.S.C. 341, 371)

Dated: January 22, 1962.

GEO. P. LARRICK,
Commissioner of Food and Drugs.

Note: See Commercial Fisheries Review, Nov. 1961 p. 70.

Department of Labor

WAGE AND HOUR AND PUBLIC CONTRACTS DIVISION

INTERPRETIVE BULLETIN ISSUED ON MINIMUM WAGE AND OVERTIME FOR FISHING AND FISHERY PROCESSING:

An interpretative bulletin was issued on February 10, 1962, on the provisions of the Fair Labor Standards Act applicable to fishing and operations on or processing of aquatic products.

The bulletin gives the official position of the Department of Labor with respect to the provisions of the Act which govern rights and obligations of employees and employers in the various enterprises engaged in fishing and related activities and in operations on or processing of aquatic products.

It points out that amendments to sections 13(a)(5) and 13(b)(4) of the Act removed a minimum wage exemption, but retained an overtime exemption, for employees engaged in the processing (other than canning), marketing, freezing, curing, storing, packing for shipment, or distributing of fish, shellfish, or other aquatic forms of animal or vegetable life and their byproducts. (Canning operations prior to enactment of the amendment were already subject to the minimum wage, but had an overtime exemption.) As a result, the minimum wage for those workers engaged in the processing (other than canning), marketing, freezing, curing, storing, packing for shipment, or distributing of fishery products or byproducts became $1.00 an hour on September 3, 1961. The amendments also extended the minimum wage and overtime exemption to employees engaged in canning and processing of marine products at sea.

The new bulletin is intended to make available in one place the official interpretations of such provisions by which the Department will be guided in carrying out its responsibilities under the Act. It discusses in some detail those exemption provisions of the Act in sections 13(a)(5) and 13(b)(4).

The complete text of the bulletin as published in the February 10 Federal Register follows:

Title 29—LABOR

Chapter V—Wage and Hour Division, Department of Labor

SUBCHAPTER B—STATEMENTS OF GENERAL POLICY OR INTERPRETATION NOT DIRECTLY RELATED TO REGULATIONS

PART 784—PROVISIONS OF THE FAIR LABOR STANDARDS ACT APPLICABLE TO FISHING AND OPERATIONS ON AQUATIC PRODUCTS

Revision

Part 784 of Chapter V, Title 29 of the Federal Regulations, is hereby revised in the manner indicated below in order to adapt it to the Fair Labor Standards Amendments of 1961 (Pub. Law 87–30).

As this revision is concerned solely with interpretative rules, neither public procedure nor delay in the effective date is required by section 4 of the Administrative Procedure Act, and it will become effective upon publication in the FEDERAL REGISTER.

As revised, 29 CFR Part 784 reads as follows:

Subpart A—General

INTRODUCTORY

Sec.
784.0 Purpose.
784.1 General scope of the Act.
784.2 Matters discussed in this part.
784.3 Matters discussed in other interpretations.
784.4 Significance of official interpretations.
784.5 Basic support for interpretations.
784.6 Interpretations made, continued, and superseded by this part.

SOME BASIC DEFINITIONS

784.7 Definition of terms used in the Act.
784.8 "Employer", "employee", and "employ".
784.9 "Person".
784.10 "Enterprise".
784.11 "Establishment".
784.12 "Enterprise engaged in commerce or in the production of goods for commerce".
784.13 "Commerce".
784.14 "Production".
784.15 "Goods".
784.16 "State".
784.17 "Regular rate".

APPLICATION OF COVERAGE AND EXEMPTION PROVISIONS OF THE ACT

784.18 Basic coverage in general.
784.19 Commerce activities of employees.
784.20 Commerce activities of enterprise in which employee is employed.
784.21 Exemption from the Act's provisions.
784.22 Guiding principles for applying coverage and exemption provisions.
784.23 Minimum wages and overtime pay for "old" and "new" coverage.
784.24 Pay standards for employees subject to "old" coverage of the Act.
784.25 Pay standards for "newly covered" employees.

Subpart B—Exemption Provisions Relating to Fishing and Aquatic Products

THE STATUTORY PROVISIONS

784.100 The section 13(a)(5) exemption.
784.101 The section 13(b)(4) exemption.

LEGISLATIVE HISTORY OF EXEMPTIONS

784.102 General legislative history.
784.103 Adoption of the exemption in the original 1938 Act.
784.104 The 1949 amendments.
784.105 The 1961 amendments.

PRINCIPLES APPLICABLE TO THE TWO EXEMPTIONS

784.106 Relationship of employee's work to named operations.
784.107 Relationship of employee's work to operations on the specified aquatic products.
784.108 Operations not included in named operations on forms of aquatic "life".
784.109 Manufacture of supplies for named operations is not exempt.
784.110 Performing operations both on nonaquatic products and named aquatic products.
784.111 Operations on named products with substantial amounts of other ingredients are not exempt.
784.112 Substantial amounts of nonaquatic products; enforcement policy.
784.113 Work related to named operations performed in off- or dead-season.
784.114 Application of exemptions on a workweek basis.
784.115 Exempt and noncovered work performed during the workweek.
784.116 Exempt and nonexempt work in the same workweek.
784.117 Combinations of exempt work.
784.118 Work subject to different minimum wage rates in same workweek.

GENERAL CHARACTER AND SCOPE OF THE SECTION 13(a)(5) EXEMPTION

Sec.
784.119 The exemption is intended for work affected by natural factors.
784.120 Effect of natural factors on named operations.
784.121 Application or exemption to "offshore" activities in general.
784.122 Exempt fisheries operations.
784.123 Operations performed as an integrated part of fishing.
784.124 Operations performed on fishing equipment.
784.125 Going to and returning from work.
784.126 Loading and unloading.
784.127 Operation of the fishing vessel.
784.128 Office and clerical employees under section 13(a)(5).

FIRST PROCESSING, CANNING, OR PACKING OF MARINE PRODUCTS UNDER SECTION 13(a)(5)

784.129 Requirements for exemption of first processing, etc. at sea.
784.130 "Marine products".
784.131 "At sea".

784.132 "As an incident to, or in conjunction with", fishing operations.
784.133 The exempt operations.
784.134 "First processing".
784.135 "Canning".
784.136 "Packing".

GENERAL CHARACTER AND SCOPE OF THE SECTION 13(b)(4) EXEMPTION

784.137 "Shore" activities exempted under section 13(b)(4).
784.138 Relationship of exemption to exemption for "offshore" activities.
784.139 Perishable state of the aquatic product as affecting exemption.
784.140 Scope of exempt operations in general.
784.141 Fabrication and handling of supplies for use in named operations.
784.142 Examples of nonexempt employees.

"CANNING"

784.143 Meaning and scope of "canning" as used in section 13(b)(4).
784.144 "Necessary preparatory operations".
784.145 Preliminary processing by the canner.
784.146 Preliminary processing by another employer as part of "canning".
784.147 Preservation of aquatic products for later canning.
784.148 Processing of aquatic products for canning and for other disposition.
784.149 "Hermetically sealing and sterilizing or pasteurizing".
784.150 "Subsequent operations".
784.151 Employees "employed in" canning.

PROCESSING, FREEZING, AND CURING

784.152 General scope of processing, freezing, and curing activities.
784.153 Typical operations that may qualify for exemption.
784.154 Named operations performed on previously processed aquatic products.
784.155 Operations performed after product is rendered nonperishable.
784.156 Operations performed on byproducts.

MARKETING, STORING, PACKING FOR SHIPMENT, AND DISTRIBUTING

784.157 General scope of named operations.
784.158 Relationship to other operations as affecting exemption.
784.159 Activities performed in wholesale establishments.

APPLICATION OF SECTION 13(b)(4) IN CERTAIN ESTABLISHMENTS

784.160 Establishments exclusively devoted to named operations.

AUTHORITY: §§ 784.0 to 784.159 issued under secs. 1–19 52 Stat. 1060, as amended; 75 Stat. 65; 29 U.S.C. 201–219.

Subpart A—General

INTRODUCTORY

§ 784.0 Purpose.

It is the purpose of this part to provide an official statement of the views of the Department of Labor with respect to the application and meaning of those provisions of the Fair Labor Standards Act which govern rights and obligations of employees and employers in the various enterprises engaged in fishing and related activities and in operations on aquatic products. The application of the Act to employment in such enterprises was broadened by amendments effective September 3, 1961. Under the amended Act, a substantial number of employees employed in the processing (other than canning), marketing, freezing, curing, storing, packing for shipment, or distributing of fish, shellfish, or other aquatic forms of animal or vegetable life and their by-products will be subject to its minimum wage provisions for the first time. Also, certain employers engaged in some of these activities may have employees who are newly subject to the Act under the amendments extending coverage to employees employed in specified enterprises engaged in commerce or in the production of goods for commerce. An exemption from minimum wages as well as overtime pay has been extended by the 1961 amendments to certain employees employed in canning of marine products at sea. It is an objective of this part to make available in one place, for the information of those who may be concerned with these and related provisions of the law, the official interpretations of such provisions by which the Department of Labor will be guided in carrying out its responsibilities under the Act.

§ 784.1 General scope of the Act.

The Fair Labor Standards Act, as amended, is a Federal statute of general application which establishes minimum wage, overtime pay, and child labor requirements that apply as provided in the Act. Employers and employees in enterprises engaged in fishing and related activities, or in operations on aquatic products on shore, need to know how the Act applies to employment in these enterprises so that they may understand their rights and obligations under the law. All employees whose employment has the relationship to interstate or foreign commerce which the Act specifies are subject to the prescribed labor standards unless specifically exempted from them. Employers having such employees are required to comply with the Act's provisions in this regard and with specified record-keeping requirements contained in Part 516 of this chapter. The law authorizes the Department of Labor to investigate for compliance and, in the event of violations, to supervise the payment of unpaid minimum wages or unpaid overtime compensation owing to any employee. The law also provides for enforcement in the courts.

§ 784.2 Matters discussed in this part.

This part discusses generally the provisions of the Act which govern its application to employers and employees in enterprises and establishments of the fisheries, seafood processing, and related industries. It discusses in some detail those exemption provisions of the Act in sections 13(a)(5) and 13(b)(4) which refer specifically to employees employed in described activities with respect to seafood and other forms of aquatic life.

§ 785.3 Matters discussed in other interpretations.

Interpretations having general application to others subject to the law, as well as to fishermen and seafood canners, processors, or distributors and their employees, have been issued on a number of subjects of general interest. These will be found in other parts of this chapter. Reference should be made to them for guidance on matters which they discuss in detail, which this part does not undertake to do. They include Part 777 of this chapter, discussing methods of payment of wages; Part 778 of this chapter, discussing computation and payment of overtime compensation; Part 785 of this chapter, discussing the calculation of hours worked; Part 791 of this chapter, discussing joint employment relationships; and Part 776 of this chapter, discussing the general coverage provisions of the Act. Reference should also be made to Subpart G of Part 4 of this title, which contains the official interpretations of the child labor provisions of the Act.

§ 784.4 Significance of official interpretations.

The regulations in this part contain the official interpretations of the Department of Labor pertaining to the exemptions provided in sections 13(a)(5) and 13(b)(4) of the Fair Labor Standards Act of 1938, as amended. It is intended that the positions stated will serve as "a practical guide to employers and employees as to how the office representing the public interest in its enforcement will seek to apply it" (Skidmore v. Swift, 323 U.S. 134, 138). These interpretations indicate the construction of the law which the Secretary of Labor and the Administrator believe to be correct and which will guide them in the performance of their duties under the Act, unless and until they are otherwise directed by authoritative decisions of the courts or conclude upon the re-examination of an interpretation that it is incorrect. The interpretations contained herein may be relied upon in accordance with section 10 of the Portal-to-Portal Act (29 U.S.C. 251–262), so long as they remain effective and are not modified, amended, rescinded, or determined by judicial authority to be incorrect.

§ 784.5 Basic support for interpretations.

The ultimate decisions on interpretations of the Act are made by the courts (Mitchell v. Zachry, 362 U.S. 310; Kirschbaum v. Walling, 316 U.S. 517). Court decisions supporting interpretations contained in this part are cited where it is believed they may be helpful. On matters which have not been determined by the courts, it is necessary for the Secretary of Labor and the Administrator to reach conclusions as to the meaning and the application of provisions of the law in order to carry out their responsibilities of administration and enforcement (Skidmore v. Swift, 323 U.S. 134). In order that these positions may be made known to persons who may be affected by them, official interpretations are issued by the Administrator on the advice of the Solicitor of Labor, as authorized by the Secretary (Reorganization Plan 6 of 1950, 64 Stat. 1263; Gen. Ord. 45A, May 24, 1950; 15 F.R. 3290). As included in the regulations in this part, these interpretations are believed to express the intent of the law as reflected in its provisions and as construed by the courts and evidenced by its legislative history. References to pertinent legislative history are made in this part where it appears that they will contribute to a better understanding of the interpretations.

§ 784.6 Interpretations made, continued, and superseded by this part.

On and after publication of this Part 784 in the FEDERAL REGISTER, the interpretations contained therein shall be in effect and shall remain in effect until they are modified, rescinded or withdrawn. This part supersedes and replaces the interpretations previously published in the FEDERAL REGISTER and

Code of Federal Regulations as Part 784 of this chapter. Prior opinions, rulings, and interpretations and prior enforcement policies which are not inconsistent with the interpretations in this part or with the Fair Labor Standards Act as amended by the Fair Labor Standards Amendments of 1961 are continued in effect; all other opinions, rulings, interpretations, and enforcement policies on the subjects discussed in the interpretations in this part are rescinded and withdrawn. The interpretations in this part provide statements of general principles applicable to the subjects discussed and illustrations of the application of these principles to situations that frequently arise. They do not and cannot refer specifically to every problem which may be met by employers and employees in the application of the Act. The omission to discuss a particular problem in this part or in interpretations supplementing it should not be taken to indicate the adoption of any position by the Secretary of Labor or the Administrator with respect to such problem or to constitute an administrative interpretation or practice or enforcement policy. Questions on matters not fully covered by this part may be addressed to the Administrator of the Wage and Hour and Public Contracts Divisions, United States Department of Labor, Washington 25, D.C., or to any Regional Office of the Divisions.

Some Basic Definitions

§ 784.7 Definition of terms used in the Act.

The meaning and application of the provisions of law discussed in this part depend in large degree on the definitions of terms used in these provisions. The Act itself defines some of these terms. Others have been defined and construed in decisions of the courts. In the following sections some of these basic definitions are set forth for ready reference in connection with the part's discussion of the various provisions in which they appear. These definitions and their application are further considered in other interpretative bulletins to which reference is made, and in the sections of this part where the particular provisions containing the defined terms are discussed.

§ 784.8 "Employer", "employee", and "employ".

The Act's major provisions impose certain requirements and prohibitions on every "employer" subject to their terms. The employment by an "employer" of an "employee" is, to the extent specified in the Act, made subject to minimum wage and overtime pay requirements and to prohibitions against the employment of oppressive child labor. The Act provides its own definitions of "employer", "employee", and "employ", under which "economic reality" rather than "technical concepts" determines whether there is employment subject to its terms (Goldberg v. Whitaker House Cooperative, 366 U.S. 28; United States v. Silk, 331 U.S. 704; Rutherford Food Corp. v. McComb, 331 U.S. 772). An "employer", as defined in section 3(d) of the Act, "includes any person acting directly or indirectly in the interest of an employer in relation to an employee but shall not include the United States or any State or political subdivision of a State, or any labor organization (other than when acting as an employer), or anyone acting in the capacity of officer or agent of such labor organization". An "employee", as defined in section 3(e) of the Act, "includes any individual employed by an employer", and "employ", as used in the Act, is defined in section 3(g) to include "to suffer or permit to work". It should be noted, as explained in Part 791 of this chapter, dealing with joint employment, that in appropriate circumstances two or more employers may be jointly responsible for compliance with the statutory requirements applicable to employment of a particular employee. It should also be noted that "employer", "enterprise", and "establishment" are not synonymous terms, as used in the Act. An employer may have an enterprise with more than one establishment, or he may have more than one enterprise, in which he employs employees within the meaning of the Act. Also, there may be different employers who employ employees in a particular establishment or enterprise.

§ 784.9 "Person".

As used in the Act (including the definition of "enterprise" set forth below in § 784.10), "person" is defined as meaning "an individual, partnership, association, corporation, business trust, legal representative, or any organized group of persons" (Act, section 3(a)).

§ 784.10 "Enterprise".

The term "enterprise" which may, in some situations, be pertinent in determining coverage of this Act to employees employed by employers engaged in the procurement, processing, or distribution of aquatic products, is defined in section 3(r) of the Act. Section 3(r) states:

> Enterprise means the related activities performed (either through unified operation or common control) by any person or persons for a common business purpose, and includes all such activities whether performed in one or more establishments or by one or more corporate or other organizational units including departments of an establishment operated through leasing arrangements, but shall not include the related activities performed for such enterprise by an independent contractor * * *.

The scope and application of this definition is discussed in Part 776 of this chapter and in §§ 779.200–779.235 of this chapter.

§ 784.11 "Establishment".

As used in the Act (including the provision quoted below in § 784.12), the term "establishment", which is not specially defined therein, refers to a "distinct physical place of business" rather than to "an entire business or enterprise" which may include several separate places of business. This is consistent with the meaning of the term as it is normally used in business and in government, is judicially settled, and has been recognized in the Congress in the course of enactment of amendatory legislation (Phillips v. Walling, 324 U.S. 490; Mitchell v. Bekins Van & Storage Co., 352 U.S. 1027; 95 Cong. Rec. 12505, 12579, 14877; H. Rept. No. 1455, 81st Cong., 1st Sess., p. 25). This is the meaning of the term as used in sections 3(r), 3(s), and 6(b) of the Act.

§ 784.12 "Enterprise engaged in commerce or in the production of goods for commerce".

Portions of the definition of "enterprise engaged in commerce or in the production of goods for commerce" (Act, section 3(s)) which may in some situations determine the application of provisions of the Act to employees employed by employers engaged in the procurement, processing, or distribution of aquatic products are as follows:

> (s) "Enterprise engaged in commerce or in the production of goods for commerce" means any of the following in the activities of which employees are so engaged, including employees handling, selling, or otherwise working on goods that have been moved in or produced for commerce by any person:
>
> * * * * *
>
> (3) any establishment of any such enterprise * * * which has employees engaged in commerce or in the production of goods for commerce if the annual gross volume of sales of such enterprise is not less than $1,000,000.
>
> * * * * *
>
> *Provided*, That an establishment shall not be considered to be an enterprise engaged in commerce or in the production of goods for commerce, or a part of an enterprise engaged in commerce or in the production of goods for commerce, and the sales of such establishment shall not be included for the purpose of determining the annual gross volume of sales of any enterprise for the purpose of this subsection, if the only employees of such establishment are the owner thereof or persons standing in the relationship of parent, spouse, or child of such owner.

The application of this definition is considered in Part 776 of this chapter.

§ 784.13 "Commerce".

"Commerce" as used in the Act includes interstate and foreign commerce. It is defined in section 3(b) of the Act to mean "trade, commerce, transportation, transmission, or communication among the several States or between any State and any place outside thereof." (For the definition of "State", see § 784.16.) The application of this definition and the kinds of activities which it includes are discussed at length in Part 776 of this chapter dealing with the general coverage of the Act.

§ 784.14 "Production".

To understand the meaning of "production" of goods for commerce as used in the Act it is necessary to refer to the definition in section 3(j) of the term "produced". A detailed discussion of the application of the term as defined is contained in Part 776 of this chapter, dealing with the general coverage of the Act. Section 3(j) provides that "produced" as used in the Act "means produced, manufactured, mined, handled, or in any other manner worked on in any State; and for the purposes of this Act an employee shall be deemed to have been engaged in the production of goods if such employee was employed in producing, manufacturing, mining, handling, transporting, or in any other manner working on such goods, or in any closely related process or occupation directly essential to the production thereof, in any State." (For the definition of "State" see § 784.16.)

§ 784.15 "Goods".

The definition in section 3(i) of the Act states that "goods", as used in the Act, means "goods (including ships and marine equipment), wares, products, commodities, merchandise, or articles or subjects of commerce of any character, or any part or ingredient thereof, but

does not include goods after their delivery into the actual physical possession of the ultimate consumer thereof other than a producer, manufacturer, or processor thereof." Part 776 of this chapter, dealing with the general coverage of the Act, contains a detailed discussion of the application of this definition and what is included in it.

§ 784.16 "State".

As used in the Act, "State" means "any State of the United States or the District of Columbia or any Territory or possession of the United States" (Act, section 3(c)). The application of this definition in determining questions of coverage under the Act's definition of "commerce" and "produced" (see §§ 784.13, 784.14) is discussed in Part 776 of this chapter, dealing with general coverage.

§ 784.17 "Regular rate".

As explained in Part 778 of this chapter, dealing with overtime compensation, employees subject to the overtime pay provisions of the Act must generally receive for their overtime work in any workweek as provided in the Act not less than one and one-half times their regular rates of pay. Section 7(d) of the Act defines the term "regular rate" "to include all remuneration for employment paid to, or on behalf of, the employee" except certain payments which are expressly described in and excluded by the statutory definition. This definition, which is discussed at length in Part 778 of this chapter, determines the regular rate upon which time and one-half overtime compensation must be computed under section 7(a) of the Act for employees within its general coverage who are not exempt from the overtime provisions under either of the fishery and seafood exemptions provided by sections 13(a)(15) and 13(b)(4) or under some other exemption contained in the Act. It should be noted that if such an employee is not himself engaged in commerce or in the production of goods for commerce as defined by the Act and in the courts, and is within the Act's coverage only by reason of his employment in an enterprise engaged in commerce or in the production of goods for commerce, under the amendments to the Act effective on September 3, 1961, there is no obligation to pay overtime to him until September 3, 1963, as explained below in § 784.25.

APPLICATION OF COVERAGE AND EXEMPTION PROVISIONS OF THE ACT

§ 784.18 Basic coverage in general.

Except as otherwise provided in specific exemptions, the minimum wage, overtime pay, and child labor standards of the Act are generally applicable to employees who engage in specified activities concerned with interstate or foreign commerce. The employment of oppressive child labor in or about establishments producing goods for such commerce is also restricted by the Act. Beginning on September 3, 1961, the monetary and child labor standards of the Act are also generally applicable to other employees, not specifically exempted, who are employed in specified enterprises engaged in such commerce or in the production of goods for such commerce. The monetary standards applicable to all the foregoing employees, covered under the provisions discussed below in §§ 784.19 and 784.20, are explained subsequently in §§ 784.23 to 784.25 of this Subpart A. The employer must observe these monetary standards with respect to all such employees in his employ except those who may be denied one or both of these benefits by virtue of some specific exemption provision of the Act, such as section 13(a)(5) or 13(b)(4). It should be noted that enterprises having employees subject to these exemptions may also have other employees who may be exempt under section 13(a)(1) of the Act, subject to conditions specified in regulations, as employees employed in a bona fide executive, administrative, or professional capacity, or in the capacity of outside salesman. The regulations governing these exemptions are set forth and explained in Part 541 of this chapter.

§ 784.19 Commerce activities of employees.

The Fair Labor Standards Act has applied since 1938 to all employees, not specifically exempted, who are engaged (a) in interstate or foreign commerce or (b) in the production of goods for such commerce, which is defined to include any closely related process or occupation directly essential to such production (29 U.S.C. 206(a), 207(a); and see §§ 784.13 to 784.16 for definitions governing the scope of this coverage). The Act as amended in 1961 continues this coverage. In general, employees of businesses concerned with fisheries and with operations on seafood and other aquatic products are engaged in interstate or foreign commerce, or in the production of goods for such commerce, as defined in the Act, and are subject to the Act's provisions except as otherwise provided in sections 13(a)(5) and 13(b)(4) or other express exemptions. A detailed discussion of the activities in commerce or in the production of goods for commerce which will bring an employee under the Act is contained in Part 776 of this chapter, dealing with general coverage.

§ 784.20 Commerce activities of enterprise in which employee is employed.

Under amendments to the Fair Labor Standards Act effective September 3, 1961 (Pub. Law 87-30, 75 Stat. 65), employees not covered by reason of their personal engagement in interstate commerce activities, as explained in § 784.19, are nevertheless brought within the coverage of the Act if they are employed in an enterprise which is defined in section 3(s) of the Act as an enterprise engaged in commerce or in the production of goods for commerce, or by an establishment described in section 3(s)(3) of the Act (see § 784.12.) Such employees, if not exempt from minimum wages and overtime pay under section 13(a)(5) or exempt from overtime pay under section 13(b)(4), will have to be paid in accordance with these monetary standards of the Act unless expressly exempt under some other provision. This would generally be true of employees employed in enterprises and by establishments engaged in the procurement, processing, marketing or distribution of seafood and other aquatic products, where the enterprise has an annual gross sales volume of $1,000,000 or more. Enterprise coverage is more fully discussed in Part 776 of this chapter, dealing with general coverage.

§ 784.21 Exemptions from the Act's provisions.

The Act provides a number of specific exemptions from the general requirements previously described. Some are exemptions from the overtime provisions only. Others are from the child labor provisions only. Several are exemptions from both the minimum wage and the overtime requirements of the Act. Finally, there are some exemptions from all three—minimum wage, overtime pay, and child labor requirements. An examination of the terminology in which the exemptions from the general coverage of the Fair Labor Standards Act are stated discloses language patterns which reflect congressional intent. Thus, Congress specified in varying degree the criteria for application of each of the exemptions and in a number of instances differentiated as to whether employees are to be exempt because they are employed by a particular kind of employer, employed in a particular type of establishment, employed in a particular industry, employed in a particular capacity or occupation, or engaged in a specified operation. (See 29 U.S.C. 203(d); 207 (b), (c), (h); 213 (a), (b), (c), (d). And see Addison v. Holly Hill, 322 U.S. 607; Mitchell v. Trade Winds, Inc., 289 F. 2d 278; Mitchell v. Stinson, 217 F. 2d 210.) In general, there are no exemptions from the child labor requirements that apply in enterprises or establishments engaged in fishing or in operations on aquatic products see Part 4, Subpart G of this Title). Such enterprises or establishments will, however, be concerned with the exemption from overtime pay in section 13(b)(4) of the Act for employees employed in specified "on-shore" operations (see § 784.101) and the exemption from minimum wages and overtime pay provided by section 13(a)(5) for employees employed in fishing, fish-farming, and other specified "off-shore" operations on aquatic products. These exemptions, which are subject to the general rules stated in § 784.22, are discussed at length in Subpart B of this Part 784.

§ 784.22 Guiding principles for applying coverage and exemption provisions.

It is clear that Congress intended the Fair Labor Standards Act to be broad in its scope. "Breadth of coverage is vital to its mission" (Powell v. U.S. Cartridge Co., 339 U.S. 497). An employer who claims an exemption under the Act has the burden of showing that it applies (Walling v. General Industries Co., 330 U.S. 545; Mitchell v. Kentucky Finance Co., 359 U.S. 290; Tobin v. Blue Channel Corp., 198 F. 2d 245, approved in Mitchell v. Myrtle Grove Packing Co., 350 U.S. 891; Fleming v. Hawkeye Pearl Button Co., 113 F. 2d 52). Conditions specified in the language of the Act are "explicit prerequisites to exemption" (Arnold v. Kanowsky, 361 U.S. 388). In their application, the purpose of the exemption as shown in its legislative history as well as its language should be given effect. However, "the details with which the exemptions in this Act have been made preclude their enlargement by implication" and "no matter how broad the exemption, it is meant to apply only to" the specified activities (Addison v. Holly Hill, 322 U.S. 607; Maneja V. Waialua, 349 U.S. 254). Exemptions provided in the

Act "are to be narrowly construed against the employer seeking to assert them" and their application limited to those who come "plainly and unmistakably within their terms and spirit." This construction of the exemptions is necessary to carry out the broad objectives for which the Act was passed (Phillips v. Walling, 324 U.S. 490; Mitchell v. Kentucky Finance Co., supra; Arnold v. Kanowsky, supra; Calaf v. Gonzales, 127 F. 2d 934; Bowie v. Gonzales, 117 F. 2d 11; Mitchell v. Stinson, 217 F. 2d 210; Fleming v. Hawkeye Pearl Button Co., 113 F. 2d 52).

§ 784.23 Minimum wages and overtime pay for "old" and "new" coverage.

Under the Act as amended in 1961, an employer may have some employees subject to its minimum wage, overtime pay, or child labor provisions who would be covered by such provisions under the "old" law even if the amendments had not been enacted, and other employees whose coverage under such provisions was provided for the first time by the 1961 amendments. As previously explained, such provisions of the Act, as amended, may apply to an employee by reason of the activities in which he is individually engaged, or because he is employed in an enterprise whose activities satisfy the conditions prescribed in the law. However, the minimum wage rates and overtime pay provisions will not be uniform for all such employees until September 3, 1965. On and after that date, every such employee subject to the minimum wage provisions will be entitled to not less than $1.25 an hour and every such employee subject to the overtime provisions will be entitled to overtime pay for all hours worked in excess of 40 in a workweek at a rate not less than one and one-half times his regular rate of pay. In contrast, during the period beginning with the effective date of the 1961 amendments on September 3, 1961 and ending September 2, 1965, the minimum wage rates applicable to employees subject to the minimum wage provisions, and the overtime pay provisions applicable to such employees who are not specifically exempt therefrom, will be different for employees in employment brought under the Act for the first time by the amendments than for employees whose coverage may be based on the "old" provisions of the Act. During this period employees whose coverage depends on the "new" provisions may be paid a lower minimum wage rate than those covered under the "old" provisions and may be employed for a longer workweek without overtime pay, as specified in the Act. Accordingly, employers who do not wish to pay to all covered employees the minimum wages and overtime pay required for employees covered under the "old" provisions will need to identify those employees who are covered under the "old" and those who are covered under the "new" provisions when wages are computed and paid under the Act.

§ 784.24 Pay standards for employees subject to "old" coverage of the Act.

The 1961 amendments did not change the tests described in § 784.20 by which coverage based on the employee's individual activities is determined. Any employee whose employment satisfies these tests and would not have come within some exemption (such as section 13(a)(5)) in the Act prior to the 1961 amendments is subject to the "old" provisions of the law and entitled to a minimum wage of at least $1.15 an hour beginning September 3, 1961 and not less than $1.25 an hour beginning September 3, 1963 (29 U.S.C. 206(a)(1)), unless expressly exempted by some provision of the amended Act. Such an employee is also entitled to overtime pay for hours worked in excess of 40 in any workweek at a rate not less than one and one-half times his regular rate of pay (29 U.S.C. 207(a)(1)), unless expressly exempt from overtime by some exemption such as section 13(b)(4). (Minimum wage rates in Puerto Rico, the Virgin Islands, and American Samoa are governed by special provisions of the Act (29 U.S.C. 206(a)(3); 206(c).) Information on these rates is available at any office of the Wage and Hour and Public Contracts Divisions.

§ 784.25 Pay standards for "newly covered" employees.

There are some employees whose individual activities would not bring them within the minimum wage or overtime pay provisions of the Act as it was prior to the 1961 amendments, but who are brought within minimum wage or overtime coverage or both for the first time by the new "enterprise" coverage provisions or changes in exemptions, or both, which were enacted as part of the amendments and made effective September 3, 1961. Typical of such employees are those who, regardless of any engagement in commerce or in the production of goods for commerce, were exempt from minimum wages as well as overtime pay by virtue of section 13(a)(5) of the Act until the 1961 amendments, but who by virtue of these amendments are exempt only from overtime pay on and after September 3, 1961, under the amended section 13(d)(4) of the Act. These "newly covered" employees for whom no specific exemption has been retained or provided in the amendments must be paid not less than the minimum wages for hours worked and unless exempted by section 13(d)(4) or some other provision, not less than one and one-half times their regular rates of pay (see § 784.18) for overtime, as shown in the following schedule:

Beginning:	Minimum wage (29 U.S.C. 206(b))	Overtime pay (29 U.S.C. 207(a)(2))
Sept. 3, 1961.....	$1 an hour.....	None required.
Sept. 3, 1963.....	No change.....	After 44 hours in a workweek.
Sept. 3, 1964.....	$1.15 an hour...	After 42 hours in a workweek.
Sept. 3, 1965 [1] and thereafter.	$1.25 an hour..	After 40 hours in a workweek.

[1] Requirements identical to those for employees under "old" coverage. (Minimum wage rates for newly covered employees in Puerto Rico, the Virgin Islands, and American Samoa are set by wage order on recommendations of special industry committees (29 U.S.C. 206(a)(3); 206(c)(2)). Information on these rates may be obtained at any Office of the Wage and Hour and Public Contracts Divisions.)

Subpart B—Exemption Provisions Relating to Fishing and Aquatic Products

THE STATUTORY PROVISIONS

§ 784.100 The section 13(a)(5) exemption.

Section 13(a)(5) grants an exemption from both the minimum wage and the overtime requirements of the Act and applies to "any employee employed in the catching, taking, propagating, harvesting, cultivating, or farming of any kind of fish, shellfish, crustacea, sponges, seaweeds, or other aquatic forms of animal and vegetable life, or in the first processing, canning or packing of such marine products at sea as an incident to, or in conjunction with, such fishing operations, including the going to and returning from work and loading and unloading when performed by any such employee."

§ 784.101 The section 13(b)(4) exemption.

Section 13(b)(4) grants an exemption only from the overtime requirements of the Act and applies to "any employee employed in the canning, processing, marketing, freezing, curing, storing, packing for shipment, or distributing of any kind of fish, shellfish, or other aquatic forms of animal or vegetable life, or any byproduct thereof."

LEGISLATIVE HISTORY OF EXEMPTIONS

§ 784.102 General legislative history.

(a) As originally enacted in 1938, the Fair Labor Standards Act provided an exemption from both the minimum wage requirements of section 6 and the overtime pay requirements of section 7 which was made applicable to "any employee employed in the catching, taking, harvesting, cultivating, or farming of any kind of fish, shellfish, crustacea, sponges, seaweeds or other aquatic forms of animal and vegetable life, including the going to and returning from work and including employment in the loading, unloading, or packing of such products for shipment or in propagating, processing, marketing, freezing, canning, curing, storing, or distributing the above products or byproducts thereof" (52 Stat. 1060, sec. 13(a)(5)).

(b) In 1949 the minimum wage was extended to employees employed in canning such products by deleting the word "canning" from the above exemption, adding the parenthetical phrase "(other than canning)" after the word "processing" therein, and providing a new exemption in section 13(b)(4), from overtime pay provisions only, applicable to "any employee employed in the canning of any kind of fish, shellfish, or other aquatic forms of animal or vegetable life, or any byproduct thereof". All other employees included in the original minimum wage and overtime exemption remained within it (63 Stat. 910).

(c) By the Fair Labor Standards Amendments of 1961, effective September 3, 1961 (75 Stat. 65), both these exemptions were further revised to read as set forth in §§ 784.100 and 784.101. The effect of this change was to provide a means of equalizing the application of the Act as between canning employees and employees employed in other processing, marketing, and distributing of aquatic products on shore, to whom minimum wage protection, formerly provided only for canning employees, was extended by this action. The 1961 amendments, however, left employees employed in fishing, in fish farming, and in related occupations concerned with procurement of aquatic products from nature, under the existing exemption from minimum wages as well as overtime pay.

§ 784.103 Adoption of the exemption in the original 1938 Act.

Although in the course of consideration of the legislation in Congress before passage in 1938, provisions to exempt employment in fisheries and aquatic products activities took various forms, section 13(a)(5), as drafted by the conference committee and finally approved, followed the language of an amendment adopted during consideration of the bill by the House of Representatives on May 24, 1938, which was proposed by Congressman Bland of Virginia. He had, earlier on the same day, offered an amendment which had as its objective the exemption of the "fishery industry", broadly defined. This amendment had been defeated (83 Cong. Rec. 7408), as had an amendment subsequently offered by Congressman Mott of Oregon (to a pending amendment proposed by Congressman Coffee of Nebraska) which would have provided an exemption for "industries engaged in producing, processing, distributing, or handling * * * fishery or seafood products which are seasonal or perishable" (83 Cong. Rec. 7421–7423). Against this background, when Congressman Bland offered his amendment which ultimately became section 13(a)(5) of the Act he took pains to explain: "This amendment is not the same. In the last amendment I was trying to define the fishery industry. I am now dealing with those persons who are exempt, and I call the attention of the Committee to the language with respect to the employment of persons in agriculture * * * I am only asking for the seafood and fishery industry that which has been done for agriculture." It was after this explanation that the amendment was adopted (83 Cong. Rec. 7443). When the conference committee included in the final legislation this provision from the House bill, it omitted from the bill another House provision granting an hours exemption for "employees in any place of employment" where the employer was "engaged in the processing of or in canning fresh fish or fresh seafood" and the provision of the Senate bill providing an hours exemption for employees "employed in connection with" the canning or other packing of fish, etc. (see Mitchell v. Stinson, 217 F. 2d 210; McComb v. Consolidated Fisheries, 75 F. Supp. 798). The indication in this legislative history that the exemption in its final form was intended to depend upon the employment of the particular employee in the specified activities is in accord with the position of the Department of Labor and the weight of judicial authority.

§ 784.104 The 1949 amendments.

In deleting employees employed in canning aquatic products from the section 13(a)(5) exemption and providing them with an exemption in like language from the overtime provisions only in section 13(b)(4), the conferees on the Fair Labor Standards Amendments of 1949 did not indicate any intention to change in any way the category of employees who would be exempt as "employed in the canning of" the aquatic products. As the Supreme Court has pointed out in a number of decisions, "When Congress amended the Act in 1949 it provided that pre-1949 rulings and interpretations by the Administrator should remain in effect unless inconsistent with the statute as amended 63 Stat. 920" (Mitchell v. Kentucky Finance Co., 359 U.S. 290). In connection with this exemption the conference report specifically indicates what operations are included in the canning process (see § 784.143). In a case decided before the 1961 amendments to the Act, this was held to "indicate that Congress intended that only those employees engaged in operations physically essential in the canning of fish, such as cutting the fish, placing it in cans, labelling and packing the cans for shipment are in the exempt category" (Mitchell v. Stinson, 217 F. 2d 210).

§ 734.105 The 1961 amendments.

(a) The statement of the Managers on the Part of the House in the conference report on the Fair Labor Standards Amendments of 1961 (H. Rep. No. 327, 87th Cong., 1st Sess., p. 16) refers to the fact that the changes made in sections 13(a)(5) and 13(b)(4) originated in the Senate amendment to the House bill and were not in the bill as passed by the House. In describing the Senate provision which was retained in the final legislation, the Managers stated that it "changes the exemption in the act for" the operations transferred to section 13(b)(4) from section 13(a)(5) "from a minimum wage and overtime exemption to an overtime only exemption." They further stated: "The present complete exemption is retained for employees employed in catching, propagating, taking, harvesting, cultivating, or farming fish and certain other marine products, or in the first processing, canning, or packing such marine products at sea as an incident to, or in conjunction with, such fishing operations, including the going to and returning from work and loading and unloading when performed by such an employee." In the report of the Senate committee on the provision included in the Senate bill (S. Rep. No. 145, 87th Cong., 1st Sess., p. 33), the committee stated: "The bill would modify the minimum wage and overtime exemption in section 13(a)(5) of the act for employees engaged in fishing and in specified activities on aquatic products." In further explanation, the report states that the bill would amend this section "to remove from this exemption those so-called onshore activities and leave the exemption applicable to 'offshore' activities connected with the procurement of the aquatic products, including first processing, canning or packing at sea performed as an incident to fishing operations, as well as employment in loading and unloading such products for shipment when performed by any employee engaged in these procurement operations." It is further stated in the report that "persons who are employed in the activities removed from the section 13(a)(5) exemption will have minimum wage protection but will continue to be exempt from the Act's overtime requirements under an amended section 13(b)(4). The bill will thus have the effect of placing fish processing and fish canning on the same basis under the Act. There is no logical reason for treating them differently and their inclusion within the Act's protection is desirable and consistent with its objectives."

(b) The language of the Managers on the Part of the House in the conference report and of the Senate committee in its report, as quoted above, is consistent with the position supported by the earlier legislative history and by the courts, that the exemption of an employee under these provisions of the Act depends on what he does. The Senate report speaks of the exemption "for employees engaged in fishing and in specified activities" and of the "activities now enumerated in this section". While this language confirms the legislative intent to continue to provide exemptions for employees employed in specified activities rather than to grant exemption on an industry, employer, or establishment basis (see Mitchell v. Trade Winds, Inc., 289 F. 2d 278), the report also refers with apparent approval to certain prior judicial interpretations indicating that the list of activities set out in the exemption provisions is intended to be "a complete catalog of the activities involved in the fishery industry" and that an employee, to be exempt, need not engage directly in the physical acts of catching, processing, canning, etc. of aquatic products which are included in the operations specifically named in the statute (McComb v. Consolidated Fisheries Co., 174 F. 2d 74). It was stated that an interpretation of section 13(a)(5) and section 13(b)(4) which would include within their purview "any employee who participates in activities which are necessary to the conduct of the operations specifically described in the exemptions" is "consistent with the congressional purpose" of the 1961 amendments. (See Sen. Rep. No. 145, 87th Cong., 1st sess., p. 33; Statement of Representative Roosevelt, 107 Cong. Rec. (daily ed.) p. 6716, as corrected May 4, 1961.) From this legislative history the intent is apparent that the application of these exemptions under the Act as amended in 1961 is to be determined by the practical and functional relationship of the employee's work to the performance of the operations specifically named in section 13(a)(5) and section 13(b)(4).

PRINCIPLES APPLICABLE TO THE TWO EXEMPTIONS

§ 784.106 Relationship of employee's work to the named operations.

It is clear from the language of section 13(a)(5) and section 13(b)(4) of the Act, and from their legislative history as discussed in §§ 784.102–784.105, that the exemptions which they provide are applicable only to those employees who are "employed in" the named operations. Under the Act as amended in 1961 and in accordance with the evident legislative intent (see § 784.105), an employee will be considered to be "employed in" an operation named in section 13(a)(5) or 13(b)(4) where his work is an essential and integrated step in performing such named operation (see Mitchell v. Myrtle Grove Packing Co., 350 U.S. 891, approving Tobin v. Blue Channel Corp., 198 F. 2d 245; Mitchell v. Stinson, 217 F. 2d 210), or where the employee is engaged in activities which are functionally so related to a named operation under the particular facts and circumstances that they are necessary to the conduct of such operation and his employment is, as a practical matter, necessarily and directly a part of carrying on the opertion for which exemption was intended (Mitchell v. Trade Winds, Inc., 289 F. 2d 278; see also Waller v. Humphreys, 133 F. 2d 193 and McComb v. Consolidated Fisheries Co., 174 F. 2d 74). Under these prin-

ciples, generally an employee performing functions without which the named operations could not go on is, as a practical matter, "employed in" such operations. It is also possible for an employee to come within the exemption provided by section 13(a)(5) or section 13(b)(4) even though he does not directly participate in the physical acts which are performed on the enumerated marine products in carrying on the operations which are named in that section of the Act. However, it is not enough to establish the applicability of such an exemption that an employee is hired by an employer who is engaged in one or more of the named operations or that the employee is employed by an establishment or in an industry in which operations enumerated in section 13(a)(5) or section 13(b)(4) are performed. The relationship between what he does and the performance of the named operations must be examined to determine whether an application of the above-stated principles to all the facts and circumstances will justify the conclusion that he is "employed in" such operations within the intendment of the exemption provision.

§ 784.107 Relationship of employee's work to operations on the specified aquatic products.

It is also necessary to the application of the exemptions that the operations of which the employee's work is a part be performed on the marine products named in the Act. Thus, the operations described in section 13(a)(5) must be performed with respect to "any kind of fish, shellfish, crustacea, sponges, seaweeds, or other aquatic forms of animal and vegetable life". The operations enumerated in section 13(b)(4) must be performed with respect to "any kind of fish, shellfish, or other aquatic forms of animal or vegetable life, or any by-product thereof". Work performed on products which do not fall within these descriptions is not within the exemptions (Fleming v. Hawkeye Pearl Button Co., 113 F. 2d 52; Mitchell v. Trade Winds, Inc., 289 F. 2d 278; Walling v. Haden, 153 F. 2d 196).

§ 784.108 Operations not included in named operations on forms of aquatic "life".

Since the subject matter of the exemptions is concerned with "aquatic forms of animal and vegetable life", the courts have held that the manufacture of buttons from clam shells or the dredging of shells to be made into lime and cement are not exempt operations because the shells are not living things (Fleming v. Hawkeye Pearl Button Co., 113 F. 2d 52; Walling v. Haden, 153 F. 2d 196, certiorari denied 328 U.S. 866). Similarly, the production of such items as crushed shell and grit, shell lime, pearl buttons, knife handles, novelties, liquid glue, isinglass, pearl essence and fortified or refined fish oil is not within these exemptions.

§ 784.109 Manufacture of supplies for named operations is not exempt.

Employment in the manufacture of supplies for the named operations is not employment in the named operations on aquatic forms of life. Thus, the exemption is not applicable to the manufacture of boxes, barrels, or ice by a seafood processor for packing or shipping its seafood products or for use of the ice in its fishing vessels. These operations, whe performed by an independent manufacturer, would likewise not be exempt (Dize v. Maddrix, 144 F. 2d 284 (C.A. 4), affirmed 324 U.S. 697, and approved on this point in Farmers' Reservoir Co. v. McComb, 337 U.S. 755).

§ 784.110 Performing operations both on nonaquatic products and named aquatic products.

By their terms, sections 13(a)(5) and 13(b)(4) provide no exemption with respect to operations performed on any products other than the aquatic products named in these subsections (see § 784.107). Accordingly, neither of the exemptions is applicable to the making of any commodities from ingredients only part of which consist of such aquatic products, if a substantial amount of other products is contained in the commodity so produced (compare Walling v. Bridgeman-Russell Co., 6 Labor Cases 61,422, 2 WH Cases 785 (D. Minn.) and Miller v. Litchfield Creamery Co., 11 Labor Cases 63,247, 5 WH Cases 1039 (N.D. Ind.), with Mitchell v. Trade Winds, Inc., 289 F. 2d 278). Thus, the first processing, canning, or processing of codfish cakes, clam chowder, dog food, crabcakes, or livestock food containing aquatic products is often not exempt within the meaning of the relevant exemptions.

§ 784.111 Operations on named products with substantial amounts of other ingredients are not exempt.

To exempt employees employed in first processing, canning, or processing products composed of the named commodities and a substantial amount of ingredients not named in the exemptions would be contrary to the language and purposes of such exemptions which specifically enumerate the commodities on which exempt operations were intended to be performed. Consequently, in such situations all operations performed on the mixed products at and from the time of the addition of the foreign ingredients, including those activities which are an integral part of first processing, canning or processing are nonexempt activities. However, activities performed in connection with such operations on the named aquatic products prior to the addition of the foreign ingredients are deemed exempt operations under the applicable exemption. Where the commodity produced from named aquatic products contains an insubstantial amount of products not named in the exemption, the operations will be considered as performed on the aquatic products and handling and preparation of the foreign ingredients for use in the exempt operations will also be considered as exempt activities.

§ 784.112 Substantial amounts of nonaquatic products; enforcement policy.

As an enforcement policy in applying the principles stated in §§ 784.110 and 784.111, if more than 20 percent of a commodity consists of products other than aquatic products named in section 13(a)(5) or 13(b)(4), the commodity will be deemed to contain a substantial amount of such nonaquatic products.

§ 784.113 Work related to named operations performed in off- or dead-season.

Generally, during the dead or inactive season when operations named in section 13(a)(5) or 13(b)(4) are not being performed on the specified aquatic forms of life, employees performing work relating to the plant or equipment which is used in such operations during the active season are not exempt. Illustrative of such employees are those who repair, overhaul, or recondition fishing equipment or processing or canning equipment and machinery during the off-season periods when fishing, processing, or canning is not going on. An exemption provided for employees employed "in" specified operations is plainly not intended to apply to employees employed in other activities during periods when the specified operations are not being carried on, where their work is functionally remote from the actual conduct of the operations for which exemption is provided and is unaffected by the natural factors which the Congress relied on as reason for exemption. The courts have recognized these principles. See Maneja v. Waialua, 349 U.S. 254; Mitchell v. Stinson, 217 F. 2d 210; Maisonet v. Central Coloso, 6 Labor Cases (CCH) par. 61,337, 2 WH Cases 753 (D. P.R.); Abram v. San Joaquin Cotton Oil Co., 49 F. Supp. 393 (S.D. Calif.), and Heaburg v. Independent Oil Mill Inc., 46 F. Supp. 751 (W.D. Tenn.). On the other hand, there may be situations where employees performing certain preseason or postseason activities immediately prior or subsequent to carrying on operations named in section 13(a)(5) or section 13(b)(4) are properly to be considered as employed "in" the named operations because their work is so close in point of time and function to the conduct of the named operations that the employment is, as a practical matter, necessarily and directly a part of carrying on the operation for which exemption was intended. Depending on the facts and circumstances, this may be true, for example, of employees who perform such work as placing boats and other equipment in condition for use at the beginning of the fishing season, and taking the necessary protective measures with respect to such equipment which are required in connection with termination of the named operations at the end of the season. Where such work is integrated with and is required for the actual conduct of the named operations on the specified aquatic forms of life, and is necessarily performed immediately before or immediately after such named operations, the employees performing it may be considered as employed in the named operations, so as to come within the exemption. It should be kept in mind that the relationship between the work of an employee and the named operations which is required for exemption is not necessarily identical with the relationship between such work and the production of goods for commerce which is suffcient to establish its general coverage under the Act. Thus, repair, overhaul, and reconditioning work during the inactive season which does not come within the exemption is nevertheless closely related and directly essential to the production of goods for commerce which takes place during the active season and, therefore, is subject to the provisions of the Act (Farmers' Reservoir Co. v. McComb, 337 U.S. 755; Mitchell v. Stinson, 217 F. 2d 210; Bowie v. Gonzalez, 117 F. 2d 11; Weaver v. Pittsburgh Steamship Co., 153 F. 2d 597, cert. den. 328 U.S. 858).

§ 784.114 Application of exemptions on a workweek basis.

The general rule is that the unit of time to be used in determining the application of the exemption to an employee is the workweek (see Overnight Motor Transportation Co. v. Missel, 316 U.S. 572; Mitchell v. Stinsen, 217 F. 2d 210; Mitchell v. Hunt, 263 F. 2d 913; Puerto Rico Tobacco Marketing Co-op. Ass'n. v. McComb, 181 F. 2d 697). Thus, the workweek is the unit of time to be taken as the standard in determining the applicability to an employee of section 13(a)(5) or section 13(b)(4) (Mitchell v. Stinson, supra). An employee's workweek is a fixed and regularly recurring period of 168 hours—seven consecutive 24-hour periods. It may begin at any hour of any day set by the employer and need not coincide with the calendar week. Once the workweek has been set it commences each succeeding week on the same day and at the same hour. Changing the workweek for the purpose of escaping the requirements of the Act is not permitted. If in any workweek an employee does only exempt work he is exempt from the wage and hours provisions of the Act during that workweek, irrespective of the nature of his work in any other workweek or workweeks. An employee may thus be exempt in one workweek and not the next (see Mitchell v. Stinson, supra). But the burden of effecting segregation between exempt and nonexempt work as between particular workweek is on the employer (see Tobin v. Blue Channel Corp., 198 F. 2d 245).

§ 784.115 Exempt and noncovered work performed during the workweek.

The wage and hours requirements of the Act do not apply to any employee during any workweek in which a portion of his activities falls within section 13(a)(5) if no part of the remainder of his activities is covered by the Act. Similarly, the overtime requirements are inapplicable in any workweek in which a portion of an employee's activities falls within section 13(b)(4) if no part of the remainder of his activities is covered by the Act. Covered activities for purposes of the above statements mean engagement in commerce, or in the production of goods for commerce, or in an occupation closely related or directly essential to such production or employment in an enterprise engaged in commerce or in the production of goods for commerce, as explained in §§ 784.17 and 784.18.

§ 784.116 Exempt and nonexempt work in the same workweek.

Where an employee, during any workweek, performs work that is exempt under section 13(a)(5) or 13(b)(4), and also performs nonexempt work, some part of which is covered by the Act, the exemption will be deemed inapplicable unless the time spent in performing nonexempt work during that week is not substantial in amount. For enforcement purposes, nonexempt work will be considered substantial in amount if more than 20 percent of the time worked by the employee in a given workweek is devoted to such work (see Mitchell v. Stinson, 217 F. 2d 210). Where exempt and nonexempt work is performed during a workweek by an employee and is not or cannot be segregated so as to permit separate measurement of the time spent in each, the employee will not be exempt (see Tobin v. Blue Channel Corp., 198 F. 2d 245; Walling v. Public Quick Freezing and Cold Storage Co., 62 F. Supp. 924).

§ 784.117 Combinations of exempt work.

The combination of exempt work under sections 13(a)(5) and 13(b)(4), or of one of these sections with exempt work under another section of the Act, is permitted. Where a part of an employee's covered work in a workweek is exempt under section 13(a)(5) and the remainder is exempt under another section which grants an exemption from the minimum wage and overtime provisions of the Act, the wage and hours requirements are not applicable. If the scope of the exemption is not the same, however, the exemption applicable to the employee is that provided by whichever exemption provision is more limited in scope unless, of course, the time spent in performing work which is nonexempt under the broader exemption is not substantial. For example, an employee may devote part of his workweek to work within section 13(b)(4) and the remainder to work exempt from both the minimum wage and overtime requirements under another section of the Act. In such a case he must receive the minimum wage but is not required to receive time and one-half for his overtime work during that week (Cf. Mitchell v. Myrtle Grove Packing Co., 350 U.S. 891; Tobin v. Blue Channel Corp., 198 F. 2d 245). Each activity is tested separately under the applicable exemption as though it were the sole activity of the employee for the whole workweek in question. Unless the employee meets all the requirements of each exemption a combination exemption would not be available.

§ 784.118 Work subject to different minimum wage rates in same workweek.

Work subject to different minimum wage rates in the same workweek calls for application of a rule similar to that generally applied where work subject to two exemptions unequal in scope is involved. For example, section 13(b)(4) exempts both employment in canning and employment in processing other than canning of the named marine products from the overtime requirements, but the minimum wage requirements that must be observed for the two operations will not be the same until September 3, 1965. If employed in canning for his entire workweek, an employee will be entitled to the higher minimum wage rate prescribed by section 6(a) of the Act; if employed in processing other than canning throughout the workweek, he will be entitled only to the lower minimum wage rate prescribed by section 6(b). Prior to the 1961 amendments the situation differed only in that the Act provided a minimum wage exemption for the employment in processing other than canning. An employee employed in canning in a particular workweek was entitled to the minimum wage applicable to such employment, however, even where his processing of aquatic products for canning was intermingled in the same workweek with the processing of such products for other purposes (see Tobin v. Blue Channel Corp., 198 F. 2d 245, approved in Mitchell v. Myrtle Grove Packing Co., 350 U.S. 891).

General Character and Scope of the Section 13(a)(5) Exemption

§ 784.119 The exemption is intended for work affected by natural factors.

As indicated by the legislative history, the purpose of the section 13(a)(5) exemption is to exempt from the minimum wage and overtime provisions of the Act employment in those activities in the fishing industry that are controlled or materially affected by natural factors or elements, such as the vicissitudes of the weather, the changeable conditions of the water, the run of the catch, and the perishability of the products obtained (83 Cong. Rec. 7408, 7443; S. Rep. No. 145, p. 33 on H.R. 3935, 87th Cong., 1st sess.; Fleming v. Hawkeye Pearl Button Co., 113 F. 2d 52; Walling v. Haden, 153 F. 2d 196, certiorari denied 328 U.S. 866).

§ 784.120 Effect of natural factors on named operations.

The various activities enumerated in section 13(a)(5)—the catching, taking, propagating, harvesting, cultivating, or farming of aquatic forms of animal or vegetable life as well as "the going to and returning from work" are materially controlled and affected by the natural elements. Similarly, the activities of "first processing, canning or packing of such marine products at sea as an incident to, or in conjunction with, such fishing operations" are subject to the natural factors mentioned above. The "loading and unloading" of such aquatic products when performed at sea are also subject to the natural forces.

§ 784.121 Application of exemption to "offshore" activities in general.

The expression "offshore activities" is used to describe the category of named operations pertaining to the acquisition from nature of aquatic forms of animal and vegetable life. As originally enacted in 1938, section 13(a)(5) exempted not only employees employed in such "offshore" or "trip" activities but also employees employed in related activities on shore which were similarly affected by the natural factors previously discussed (see § 784.103, and Fleming v. Hawkeye Pearl Button Co., 113 F. 2d 52). However, the intent of the 1961 amendments to the Act was to remove from the exemption the so-called onshore activities and "leave the exemption applicable to 'offshore' activities connected with the procurement of the aquatic products" (S. Rep. 145, 87th Cong., 1st sess., p. 33). Despite its comprehensive reach (see §§ 784.105 and 784.106), the exemption, like the similar exemption in the Act for agriculture, is "meant to apply only" to the activities named in the statute (see Maneja v. Waialua, 349 U.S. 254; Farmers Reservoir Co. v. McComb, 337 U.S. 755).

§ 784.122 Exempt fisheries operations.

Employees engaged in the named operations, such as "catching" or "taking," are clearly exempt. As indicated in § 784.106, employees engaged in activities that are "directly and necessarily a part of" an enumerated operation are also exempt (Mitchell v. Trade Winds, Inc., 289 F. 2d 278). The "catching, taking, propagating, harvesting, cultivating, or farming" of the various forms of aquatic life includes not only the actual performance of the activities, but also the usual duties inherent in the occupations

of those who perform the activities. Thus, the fisherman who is engaged in "catching" and "taking" must see to it that his lines, nets, seines, traps, and other equipment are not fouled and are in working order. He may also have to mend or replace his lines or nets or repair or construct his traps. Such activities are an integral part of the operations of "catching" and "taking" of an aquatic product.

§ 784.123 Operations performed as an integrated part of fishing.

Certain other activities performed on a fishing vessel in connection with named operations are, functionally and as a practical matter, directly and necessarily a part of such operations. For example, maintenance work performed by members of the fishing crew during the course of the trip on the fishing boat would necessarily be a part of the fishing operation, since the boat itself is as much a fishing instrument as the fishing rods or nets. Similarly, work required on the vessel to keep in good operating condition any equipment used for processing, canning or packing the named aquatic products at sea is so necessary to the conduct of such operations that it must be considered a part of them and exempt.

§ 784.124 Operations performed on fishing equipment.

On the principle stated in § 784.122, the replacement, repair, mending, or construction of the fisherman's equipment performed at the place of the fishing operation would be exempt. Such activities performed in contemplation of the trip are also within the exemption if the work is so closely related both in point of time and function to the acquisition of the aquatic life that it is really a part of the fishing operation or of "going to * * * work." For example, under appropriate facts, the repair of the nets, or of the vessel, or the building of fish trap frames on the shore immediately prior to the opening of the fishing season would be within the exemption. Activities at the termination of a fishing trip which are similarly related in time and function to the actual conduct of fishing operations or "returning from work" may be within the exemption on like principles. Similarly, the fact that the exemption is intended generally for "offshore" activities does not mean that it may not apply to employment in other activities performed on shore which are so integrated with the conduct of actual fishing operations and functionally so necessary thereto that the employment is, in practical effect, directly and necessarily a part of the fishing operations for which the exemption is intended. In such circumstances the exemption will apply, for example, to an employee employed by a vessel owner to watch the fishing vessel, its equipment, and the catch when it comes to port, check the mooring lines, operate bilge pumps and heating and cooling systems on the vessel, and assist in the loading and unloading of the fishing equipment and the catch. Work of the kinds referred to may be exempt when performed by the fisherman himself or by some other employee of the fishing organization. However, the exemption would not apply to employees of a manufacturer of supplies or to employees of independent shops which repair boats and equipment (Dize v. Maddrix, 144 F. 2d 584 affirmed 324 U.S. 697).

§ 784.125 Going to and returning from work.

The phrase "including the going to and returning from work" relates to the preceding named operations which pertain to the procuring and appropriation of seafood and other forms of aquatic life from nature. The expression obviously includes the time spent by fishermen and others who go to and from the fishing grounds or other locations where the aquatic life is reduced to possession. If going to work requires fishermen to prepare and carry the equipment required for the fishing operation, this would be included within the exemption. In performing such travel the fishermen may be required to row, guide or sail the boat or otherwise assist in its operation. Similarly, if an employee were digging for clams or other shellfish or gathering seaweed on the sand or rocks it might be necessary to drive a truck or other vehicle to reach his destination. Such activities are exempt within the meaning of this language. However, the phrase does not apply to employees who are not employed in the activities involved in the acquisition of aquatic animal or vegetable life, such as those going to or returning from work at processing or refrigerator plants or wholesale establishments.

§ 784.126 Loading and unloading.

The term "loading and unloading" applies to activities connected with the removal of aquatic products from the fishing vessel and their initial movement to markets or processing plants. The term, however, is not without limitation. The statute by its clear language makes these activities exempt only when performed by any employee employed in the procurement activities enumerated in section 13(a)(5). This limitation is confirmed by the legislative history of the 1961 amendments which effectuated this change in the application of this term (S. Rep. 145, 87th Cong., 1st sess., p. 33). Consequently, members of the fishing crew engaged in loading and unloading the catch of the vessel to another vessel at sea or at the dockside would be engaging in exempt activities within the meaning of section 13(a)(5). On the other hand, dock workers performing the same kind of tasks would not be within the exemption.

§ 784.127 Operation of the fishing vessel.

In extending the minimum wage to seamen on American vessels by limiting the exemption from minimum wages and overtime provided by section 13(a)(14) of the Act to "any employee employed as a seaman on a vessel other than an American vessel," and at the same time extending the minimum wage to "onshore" but not "offshore" operations concerned with aquatic products, the Congress, in the 1961 amendments to the Act, did not indicate any intent to remove the crews of fishing vessels engaged in operations named in section 13(a)(5) from the exemption provided by that section. The exemption provided by section 13(a)(14), above noted, and the general exemption in section 13(b)(6) from overtime for "any employee employed as a seamen" (whether or not on an American vessel) apply, in general, to employees, working aboard vessels, whose services are rendered primarily as an aid to navigation. It appears, however, that it is not the custom or practice in the fishing industry for a fishing vessel to have two crews namely a fishing crew whose duty it is primarily to fish and to perform other duties incidental thereto and a navigational crew whose duty it is primarily to operate the boat. Where, as is the typical situation, there is but one crew which performs all these functions, the section 13(a)(5) exemption would apply to its members. For a further explanation of the seaman's exemption see Part 783 of this chapter.

§ 784.128 Office and clerical employees under section 13(a)(5).

Office and clerical employees, such as bookkeepers, stenographers, typists, and others who perform general office work of a firm engaged in operating fishing boats are not for that reason within the section 13(a)(5) exemption. Under the principles stated in § 784.106, their general office activities are not a part of any of the named operations even when they are selling, taking and putting up orders, or recording sales, taking cash or making telephone connections for customer or dealer calls. Employment in the specific activities enumerated in the preceding sentence would ordinarily, however, be exempt under section 13(b)(4) since such activities constitute "marketing" or "distributing" within the meaning of that exemption (see § 784.157). In certain circumstances, office or clerical employees may come within the section 13(a)(5) exemption. If, for example, it is necessary to the conduct of the fishing operations that such employees accompany a fishing expedition to the fishing grounds to perform certain work required there in connection with the catch, their employment under such circumstances may, as a practical matter, be directly and necessarily a part of the operations for which exemption was intended, in which event the exemption would apply to them.

FIRST PROCESSING, CANNING, OR PACKING OF MARINE PRODUCTS UNDER SECTION 13(a)(5)

§ 784.129 Requirements for exemption of first processing, etc., at sea.

A complete exemption from minimum and overtime wages is provided by section 13(a)(5) for employees employed in the operations of first processing, canning, or packing of marine products at sea as an incident to, or in conjunction with "such" fishing operations—that is, the fishing operations of the fishing vessel (S. Rep. 145, 87th Cong., 1st sess., p. 33). To qualify under this part of the exemption, there must be a showing that (1) the work of the employees is such that they are, within the meaning of the Act, employed in one or more of the named operations of first processing, canning or packing, (2) such operations

are performed as an incident to, or in conjuction with, fishing operations of the vessel, (3) such operations are performed at sea, and (4) such operations are performed on the marine products specified in the statute.

§ 784.130 "Marine products."

The marine products which form the basis of the exemption are the "fish, shellfish, crustacea, sponges, seaweeds, or other aquatic forms of animal and vegetable life" mentioned in section 13(a)(5). The exemption contemplates aquatic products currently or recently acquired and in the form obtained from the sea, since the language of the exemption clearly indicates the named operations of first processing, canning, or packing must be performed "at sea" and "as an incident to, or in conjunction with", fishing operations. Also, such "marine products" are limited to aquatic forms of "life."

§ 784.131 "At sea."

The "at sea" requirement must be construed in context and in such manner as to accomplish the statutory objective. The section 13(a)(5) exemption is for the "catching, taking, propagating, harvesting," etc., of "aquatic forms of animal and vegetable life." There is no limitation as to where these activities must take place other than, as the legislative history indicates, that they are "offshore" activities. Since the purpose of the 1961 amendments is to exempt the "first processing, canning or packing such marine products at sea as an incident to, or in conjunction with, such fishing operations," it would frustrate this objective to give the phrase "at sea" a technical or special meaning. For example, to define "at sea" to include only bodies of water subject to the ebb and flow of the tides or to saline waters would exclude the Great Lakes which obviously would not comport with the legislative intent. On the other hand, one performing the named activities of first processing, canning, or packing within the limits of a port or harbor is not performing them "at sea" within the meaning of the legislative intent although the situs of performance is subject to tidewaters. In any event it would not appear necessary to draw a precise line as to what constitutes "at sea" operations, for, as a practical matter, such first processing, canning, or packing operations are those closely connected with the physical catching of the fish and are performed on the fishing vessel shortly or immediately following the "catching" and "taking" of the fish.

§ 784.132 "As an incident to, or in conjunction with" fishing operations.

The statutory language makes clear that the "first processing, canning or packing," unlike the other named operations of "catching, taking, propagating, harvesting, cultivating, or farming" are not exempt operations in and of themselves. They are exempt only when performed "as an incident to, or in conjunction with such fishing operations" (see Farmers Reservoir Co. v. McComb, 337 U.S. 755). It is apparent from the context that the language "such fishing operations" refers to the principal named operations of "catching, taking, propagating, harvesting, cultivating, or farming" as performed by the fishermen or fishing vessel (compare Bowie v. Gonzalez, 117 F. 2d 11). Therefore to be "an incident to, or in conjunction with such fishing operations," the first processing, canning, or packing must take place upon the vessel that is engaged in the physical catching, taking, etc., of the fish. This is made abundantly clear by the legislative history. In Senate Report No. 145, 87th Congress, 1st session, at page 33, it pointed out:

> For the same reasons, there was included in section 13(a)(5) as amended by the bill an exemption for the "first processing, canning or packing" of marine products "at sea as an incident to, or in conjunction with such fishing operations." The purpose of this additional provision is to make certain that the Act will be uniformly applicable to all employees on the fishing vessel including those employees on the vessel who may be engaged in these activities at sea as an incident to the fishing operations conducted by the vessel.

In accordance with this purpose of the section, the exemption is available to an employee on a fishing vessel who is engaged in first processing fish caught by fishing employees of that same fishing vessel; it would not be available to such an employee if some or all of the fish being first processed were obtained from other fishing vessels, regardless of the relationship, financial or otherwise, between such vessels (cf. Mitchell v. Hunt, 263 F. 2d 913; Farmers Reservoir Co. v. McComb, 337 U.S. 755).

§ 784.133 The exempt operations.

The final requirement is that the employee on the fishing vessel must be employed in "the first processing, canning or packing" of the marine products. The meaning and scope of these operations when performed at sea as an incident to the fishing operations of the vessel are set forth in §§ 784.134 to 784.136. To be "employed in" such operations the employee must, as previously explained (see §§ 784.106 and 784.122), be engaged in work which is clearly part of the named activity.

§ 784.134 "First processing."

Processing connotes a change from the natural state of the marine product and first processing would constitute the first operation or series of continuous operations that effectuate this change. It appears that the first processing operations ordinarily performed on the fishing vessels at sea consist for the most part of eviscerating, removal of the gills, beheading certain fish that have large heads, and the removal of the scallop from its shell. Icing or freezing operations, which ordinarily immediately follow these operations, would also constitute an integral part of the first processing operations, as would such activities as filleting, cutting, scaling, or salting when performed as part of a continuous series of operations. Employment aboard the fishing vessel in freezing operations thus performed is within the exemption if the first processing of which it is a part otherwise meets the conditions of section 13(a)(5), notwithstanding the transfer by the 1961 amendments of "freezing," as such, from this exemption to the exemption from overtime only provided by section 13(b)(4). Such preliminary operations as cleaning, washing and grading of the marine products, though not exempt as first processing since they effect no change, would be exempt as part of first processing when done in preparation for the first processing operation described above including freezing. The same would be true with respect to the removal of the waste products resulting from the above described operations on board the fishing vessel.

§ 784.135 "Canning."

The term "canning" was defined in the legislative history of the 1949 amendments (House (Conference) Report No. 1453, 81st Cong., 1st sess.; 95 Cong. Rec. 14878, 14932–33). These amendments made the "canning" of marine products or byproducts exempt from overtime only under a separate exemption (section 13(b)(4)), and subject to the minimum wage requirements of the Act (see § 784.137 et seq.). The same meaning will be accorded to "canning" in section 13(a)(5) as in section 13(b)(4) (see § 784.143 et seq.) subject, of course, to the limitations necessarily imposed by the context in which it is found. In other words, although certain operations as described in § 784.143 et seq. qualify as canning, they are, nevertheless, not exempt under section 13(a)(5) unless they are performed on marine products by employees of the fishing vessel at sea as an incident to, or in conjunction with, the fishing operations of the vessel.

§ 784.136 "Packing."

The packing of the various named marine products at sea as an incident to, or in conjunction with, the fishing operations of the vessel is an exempt operation. The term "packing" refers to the placing of the named product in containers, such as boxes, crates, bags and barrels. Activities such as washing, grading, sizing and placing layers of crushed ice in the containers are deemed a part of packing when performed as an integral part of the packing operation. The packing operation may be a simple or complete and complex operation depending upon the nature of the marine product, the length of time out and the facilities aboard the vessel. Where the fishing trip is of short duration, the packing operation may amount to no more than the simple operation of packing the product in chipped or crushed ice in wooden boxes, as in the case of shrimp, or placing the product in wooden boxes and covering with seaweed as in the case of lobsters. Where the trips are of long duration, as for several weeks or more, the packing operations on fishing vessels with the proper equipment sometimes are integrated with first processing operations so that together these operations amount to readying the product in a marketable form. For example, in the case of shrimp, the combined operations may consist of the following series of operations—washing, grading, sizing, placing

in 5-pound boxes already labeled for direct marketing, placing in trays with other boxes, loading into a quick freezer locker, removing after freezing, emptying the box, glazing the contents with a spray of fresh water, replacing in box, putting them in 50-pound master cartons and finally stowing in refrigerated locker.

GENERAL CHARACTER AND SCOPE OF THE SECTION 13(b)(4) EXEMPTION

§ 784.137 "Shore" activities exempted under section 13(b)(4).

Section 13(b)(4) provides an exemption from the overtime but not from the minimum wage provisions of the Act for "any employee employed in the canning, processing, marketing, freezing, curing, storing, packing for shipment, or distributing" aquatic forms of animal and vegetable life or any byproducts thereof. Originally, all these operations were contained in the exemption provided by section 13(a)(5) but, as a result of amendments, first "canning," in 1949, and then the other operations in 1961, were transferred to section 13(b)(4). (See the discussion in §§ 784.102 to 784.105.) These activities are "shore" activities and in general have to do with the movement of the perishable aquatic products to a nonperishable state or to points of consumption (S. Rep. 145, 87th Cong., 1st sess., p. 33).

§ 784.138 Relationship of exemption to exemption for "offshore" activities.

The reasons advanced for exemption of employment in "shore" operations, now listed in section 13(b)(4), at the time of the adoption of the original exemption in 1938, had to do with the difficulty of regulating hours of work of those whose operations, like those of fishermen, were stated to be governed by the time, size, availability and perishability of the catch, all of which were considered to be affected by natural factors that the employer could not control (see 83 Cong. Rec. 7408, 7422, 7443). The intended limited scope of the exemption in this respect was not changed by transfer of the "shore" activities from section 13(a)(5) to section 13(b)(4). The exemption of employment in these "shore" operations may be considered, therefore, as intended to implement and supplement the exemption for employment in "offshore" operations provided by section 13(a)(5), by exempting from the hours provisions of the Act employees employd in those "shore" activities which are necessarily somewhat affected by the same natural factors. These "shore" activities are affected primarily, however, by fluctuations in the supply of the product or by the necessity for consumption or preservation of such products before spoilage occurs (see Fleming v. Hawkeye Pearl Button Co., 113 F. 2d 52; cf. McComb v. Consolidated Fisheries, 174 F. 2d 74).

§ 784.139 Perishable state of the aquatic product as affecting exemption.

(a) Activities performed after the conversion of an aquatic product to a nonperishable state cannot form the basis for application of the section 13(b)(4) exemption unless the subsequent operation is so integrated with the performance of exempt operations on the aquatic forms of animal and vegetable life mentioned in the section that functionally and as a practical matter it must be considered a part of the operations for which exemption was intended. The exemption is, consequently, not available for the handling or shipping of nonperishable products by an employer except where done as a part of named operations commenced on the product when it was in a perishable state. Thus, employees of dealers in or distributors of such nonperishable products as fish oil and fish meal, or canned seafood, are not within the exemption. Similarly, there is no basis for application of the exemption to employees employed in further processing of or manufacturing operations on products previously rendered nonperishable, such as refining fish oil or handling fish meal in connection with the manufacture of feeds. Further specific examples of application of the foregoing principle are given in the subsequent discussion of particular operations named in section 13(b)(4).

(b) In applying the principle stated in paragraph (a) of this section, the Department has not asserted that the exemption is inapplicable to the performance of the operations described in section 13(b)(4) on frozen, smoked, salted, or cured fish. The Department will continue to follow this policy until further clarification from the courts.

§ 784.140 Scope of exempt operations in general.

Exemption under section 13(b)(4), like exemption under section 13(a)(5), depends upon the employment in the actual activities named in the section, and an employee performing a function which is not necessary to the actual conduct of a named activity, as explained in § 784.106, is not within the exemption. It is also essential to exemption that the operations named in section 13(b)(4) be performed on the forms of aquatic life specified in the section and not on other commodities or on mixed commodities a substantial part of which consist of materials or products other than the named aquatic products. Application of these principles has been considered generally in the earlier discussion, and further applications will be noted in the following sections and in the subsequent discussion of particular operations mentioned in the section 13(b)(4) exemption.

§ 784.141 Fabrication and handling of supplies for use in named operations.

(a) As noted in § 784.109, the exemption for employees employed "in" the named operations does not extend to an employee by reason of the fact that he engages in fabricating supplies for the named operations. Employment in connection with the furnishing of supplies for the processing or canning operations named in section 13(b)(4) is not exempt as employment "in" such named operations unless the functional relationship of the work to the actual conduct of the named operations is such that, as a practical matter, the employment is directly and necessarily a part of the operations for which exemption is intended. Employees who meet the daily needs of the canning or processing operations by delivering from stock, handling, and working on supplies such as salt, condiments, cleaning supplies, containers, etc., which must be provided as needed if the named operations are to continue, are within the exemption because such work is, in practical effect, a part of the operations for which exemption is intended. On the other hand, the receiving, unloading, and storing of such supplies during seasons when the named operations are not being carried on, for subsequent use in the operations expected to be performed during the active season, are ordinarily too remote from the actual conduct of the named operations to come within the exemption (see § 784.113), and are not affected by the natural factors (§ 784.138) which were considered by the Congress to constitute a fundamental reason for providing the exemption. Whether the receiving, unloading, and storing of supplies during periods when the named operations are being carried on are functionally so related to the actual conduct of the operations as to be, in practical effect, a part of the named operations and within the exemption, will depend on all the facts and circumstances of the particular situation and the manner in which the named operations are carried on. Normally, where such activities are directed to building up stock for use at a relatively remote time and there is no direct integration with the actual conduct of the named operations, the exemption will not apply.

(b) It may be that employees are engaged in the same workweek in performing exempt and nonexempt work. For example, a shop machinist engaged in making a new part to be used in the repair of a machine currently used in canning operations would be doing exempt work. If he also in the same workweek makes parts to be used in a manufacturing plant operated by his employer, this work, since it does not directly or necessarily contribute to the conduct of the canning operations, would be nonexempt work causing the loss of the exemption if such work occupied a substantial amount (for enforcement purposes, more than 20 percent) of the employee's worktime in that workweek (see § 784.116 for a more detailed discussion).

§ 784.142 Examples of nonexempt employees.

An employer who engages in operations specified in section 13(b)(4) which he performs on the marine products and byproducts described in that section may operate a business which engages also in operations of a different character or one in which some of the activities carried on are not functionally necessary to the conduct of operations named in section 13(b)(4). In such a business there will ordinarily be, in addition to the employees employed in such named operations, other employees who are nonexempt because their work is concerned entirely or in substantial part with carrying on activities which constitute neither the actual engagement in the named operations nor the performance of functions

which are, as a practical matter, directly and necessarily a part of their employer's conduct of such named operations. Ordinarily, as indicated in § 784.160, such nonexempt employees will not be employed in an establishment which is exclusively devoted by the employer to the named operations during the period of their employment. It is usually when the named operations are not being carried on, or in places wholly or partly devoted to other operations, that employees of such an employer will be performing functions which are not so necessarily related to the conduct of the operations named in section 13(b)(4) as to come within the exemption. Typical illustrations of the occupations in which such nonexempt workers may be found (although employment in such an occupation does not necessarily mean that the worker is nonexempt) are the following: General office work (such as maintaining employment, social security, payroll and other records, handling general correspondence, etc., as distinguished from "marketing" or "distributing" work like that described in § 784.159), custodial, maintenance, watching, and guarding occupations; furnishing food, lodging, transportation, or nursing services to workers; and laboratory occupations such as those concerned with development of new products. Such workers are, of course, not physically engaged in operations named in section 13(b)(4) in the ordinary case, and they are not exempt unless they can be shown to be "employed in" such operations on other grounds. But any of them may come within the exemption in a situation where the employer can show that the functions which they perform, in view of all the facts and circumstances under which the named operations are carried on, are actually so integrated with or essential to the conduct of the named operations as to be, in practical effect, directly and necessarily a part of the operations for which exemption was intended. Thus, for example, if canning operations described in section 13(b)(4) are carried on in a location where the canning employees cannot obtain necessary food unless the canner provides it, his employment of culinary employees to provide such food is functionally so necessary to the conduct of the canning operations that their work is, as a practical matter, a part of such operations, and the exemption will apply to them. On like principle, the exemption may apply to a watchman whose services are required during performance of the named operations in order to guard against spontaneous combustion of the products of such operations and other occurrences which may jeopardize the conduct of the operations.

"CANNING"

§ 784.143 Meaning and scope of "canning" as used in section 13(b)(4).

Section 13(b)(4) exempts any employee employed in the canning of aquatic forms of animal or vegetable life or byproducts thereof from the overtime requirements of the Act. As previously stated, it was made a limited exemption by the Fair Labor Standards Act Amendments of 1949. The legislative history of this section in specifically explaining what types of activities are included in the term "canning" and the antecedents from which this section evolved make it clear that the exemption applies to those employees employed in the activities that Congress construed as being embraced in the term and not to all those engaged in the fish canning industry (Mitchell v. Stinson, 217 F. 2d 214). Congress defined the term "canning" (House (Conference) Report No. 1453, 81st Cong., 1st sess. 95 Cong. Rec. 14878, 14932–33) as follows:

> Under the conference agreement "canning" means hermetically sealing and sterilizing or pasteurizing and has reference to a process involving the performance of such operations. It also means other operations performed in connection therewith such as necessary preparatory operations performed on the products before they are placed in bottles, cans, or other containers to be hermetically sealed, as well as the actual placing of the commodities in such containers. Also included are subsequent operations such as the labeling of the cans or other containers and the placing of the sealed containers in cases or boxes whether such subsequent operations are performed as part of an uninterrupted or interrupted process. It does not include the placing of such products or byproducts thereof in cans or other containers that are not hermetically sealed as such an operation is "processing" as distinguished from "canning" and comes within the complete exemption contained in section 13(a)(5).

Of course, the processing other than canning, referred to in the last sentence quoted above, is now, like canning, in section 13(b)(4) rather than section 13(a)(5).

§ 784.144 "Necessary preparatory operations."

All necessary preparatory work performed on the named aquatic products as an integral part of a single uninterrupted canning process is subject to section 13(b)(4) (see Tobin v. Blue Channel Corp., 198 F. 2d 245, approved in Mitchell v. Myrtle Grove Packing Co., 350 U.S. 891). Such activities conducted as essential and integrated steps in the continuous and uninterrupted process of canning are clearly within the definition of "canning" as contemplated by Congress and cannot be viewed in isolation from the canning process as a whole. Exempt preparatory operations include the necessary weighing, cleaning, picking, peeling, shucking, cutting, heating, cooling, steaming, mixing, cooking, carrying, conveying, and transferring to the containers the exempt aquatic products (see Mitchell v. Stinson, 217 F. 2d 214). But the preparatory operations do not include operations specified in section 13(a)(5) pertaining to the acquisition of the exempt products from nature. Therefore, if a canner employs fishermen or others to catch, take, harvest, cultivate, or farm aquatic animal and vegetable life, section 13(a)(5) and not section 13(b)(4) would apply to these particular operations.

§ 784.145 Preliminary processing by the canner.

The mere fact that operations preparatory to canning are physically separated from the main canning operations of hermetically sealing and sterilizing or pasteurizing would not be sufficient to remove them from the scope of section 13(b)(4). Where preparatory operations such as the steaming or shucking of oysters are performed in an establishment owned, operated, or controlled by a canner of seafood as part of a process consisting of a continuous series of operations in which such products are hermetically sealed in containers and sterilized or pasteurized, all employees who perform any part of such series of operations on any portion of such aquatic products for canning purposes are within the scope of the term "canning."

§ 784.146 Preliminary processing by another employer as part of "canning."

If the operations of separate processors are integrated in producing canned seafood products, all employees of such processors who perform any part of the described continuous series of operations to accomplish this result would be "employed in the canning of" such products. Moreover, preliminary operations performed in a separately owned processing establishment which are directed toward the particular requirements of a cannery pursuant to some definite arrangement between the operators of the two establishments would generally appear to be integrated with the cannery operations within the meaning of the above principles, so that the employees engaged in the preliminary operations in the separate establishment would be employed in "canning" within the meaning of section 13(b)(4) of the Act. Whether or not integration exists in a specific case of this general nature will depend, of course, upon all the relevant facts and circumstances in such case.

§ 784.147 Preservation of aquatic products for later canning.

The cooling, icing, or refrigeration of the acquatic products in the course of canning does not constitute such a break or discontinuance of the process as to bring the preparatory operations within other named operations in section 13(b)(4) instead of canning if the purpose of the refrigeration is to prevent spoilage for a short period, such as over the weekend, or during the transfer or shipment of the prepared products, or directly prior to the opening of the canning season. On the other hand, the freezing of aquatic products to be stored for a protracted or indefinite period for future canning is too remote from the actual canning to be considered as a part of that operation; it would, however, qualify as a "freezing" operation which is an exempt operation named in section 13(b)(4). This distinction is not without significance, for, as an exempt freezing operation, employees engaged therein are entitled to the minimum wage prescribed by section 6(b) of the Act for those to whom the minimum wage benefits are being extended for the first time as a result of the Fair Labor Standards Act amendments of 1961, rather than the minimum wage prescribed by section 6(a) of the Act for employees performing work which was

subject to the minimum wage prior to these amendments (§§ 784.23 to 784.25).

§ 784.148 Processing of aquatic products for canning and for other disposition.

Where canning and processing operations are intermingled, the former and not the latter exemption applies (see Mitchell v. Myrtle Grove Packing Company, 350 U.S. 891; Tobin v. Blue Channel Corporation, 198 F. 2d 245). Thus, where preparatory operations are performed on fish or seafood, some of which are to be canned and some of which are for processing, all the necessary preparatory operations are exempt as part of canning until that point in the operations where the commodity is channeled to accomplish the separate objectives, namely, canning or processing. Thereafter, the canning operations would be exempt as canning and the processing operations would be exempt as processing. For example, all the preparatory activities in a roe canning plant such as any unloading of the fish, cutting off the heads and tails, cleaning and scaling leading up to and including the extraction of the roe would qualify as canning operations, whereas the subsequent boning and filleting of the fish would come within processing operations when none of the filleted fish is to be canned. The minimum rates applicable in such a situation would be determined in accordance with the principles stated in §§ 784.23 to 784.25 of Subpart A of this Part 784.

§ 784.149 "Hermetically sealing and sterilizing or pasteurizing."

As previously indicated in § 784.143, hermetically sealing and sterilizing or pasteurizing are the operations which characterize the process of canning. Employment in such operations is clearly within the section 13(b)(4) exemption. Employees whose work does not relate to a process which includes these operations are not employed in canning. A process involving the placing of the aquatic products in cans or containers without hermetically sealing and sterilizing or pasteurizing is not canning, within the meaning of the exemption. Depending on the operations involved it may be "processing" or "packing for shipment" within the scope of the exemption, in which event the pay provisions for "new" rather than those for "old" coverage will be applicable, as explained in §§ 784.23 to 784.25, in Subpart A of this Part 784.

§ 784.150 "Subsequent operations."

Canning, within the meaning of the exemption, includes operations performed after hermetic sealing of the cans or other containers, such as labeling of them and placing of them in cases or boxes, which are required to place the canned product in the form in which it will be sold or shipped by the canner. This is so whether or not such operations immediately follow the actual canning operations as a part of an uninterrupted process. Storing and shipping operations performed by the employees of the cannery in connection with its canned products, during weeks in which canning operations are going on, to make room for the canned products coming off the line or to make storage room come within the exemption as a part of canning. The fact that such activities relate in part to products canned during previous weeks or seasons would not affect the application of the exemption, provided canning operations such as hermetic sealing and sterilizing, or labeling, are currently being carried on. When, however, operations with respect to the aquatic products processed by the employer are performed as a part of his activities in "marketing * * * storing, packing for shipment, or distributing" such products rather than as a part of canning as above described (cf. Calaf v. Gonzalez, 127 F. 2d 934; Tobin v. Blue Channel Corp., 198 F. 2d 245; Mitchell v. Myrtle Grove Packing Co., 350 U.S. 891), these operations, while also exempt under section 13(b)(4), are subject to the minimum wage provisions of section 6(b) rather than section 6(a) of the Act and, if intermingled with those which are part of canning, will be subject to the rules stated previously in §§ 784.23 to 784.25, in Subpart A of this Part 784.

§ 784.151 Employees "employed in" canning.

All employees whose activities are directly and necessarily a part of the "canning" of the specified aquatic forms of life are within the exemption provided by section 13(b)(4). Thus, employees engaged in handling the fish or seafood, placing it into the cans, providing steam for cooking it, or operating the machinery that seals the cans or the equipment that sterilizes the canned product are engaged in exempt activities. In addition, can loft workers, those engaged in removing and carrying supplies from the stock room for current use in canning operations, and employees whose duty it is to reform cans, when canning operations are going on, for current use, are engaged in exempt activities. Similarly, the repairing, oiling, or greasing during the active season of canning machinery or equipment currently used in the actual canning operations are exempt activities. The making of repairs in the production room such as to the floor around the canning machinery or equipment would also be deemed exempt activities where the repairs are essential to the continued canning operations or to prevent interruptions in the canning operations. These examples are illustrative but not exhaustive. Employees engaged in other activities which are similiarly integrated with and necessary to the actual conduct of the canning operations will also come within the exemption. Employees whose work is not directly and necessarily a part of the canning operations are not exempt. See §§ 784.106, 784.141, and 784.142.

PROCESSING, FREEZING, AND CURING

§ 784.152 General scope of processing, freezing, and curing activities.

Processing, freezing, and curing embrace a variety of operations that change the form of the "aquatic forms of animal and vegetable life." They include such operations as filleting, cutting, scaling, salting, smoking, drying, pickling, curing, freezing, extracting oil, manufacturing meal or fertilizer, drying seaweed preparatory to the manufacture of agar, drying and cleaning sponges (Fleming v. Hawkeye Pearl Button Co., 113 F. 2d 52).

§ 784.153 Typical operations that may qualify for exemption.

Such operations as transporting the specified aquatic products to the processing plant; moving the products from place to place in the plant; cutting, trimming, eviscerating, peeling, shelling and otherwise working on the products; packing the products; and moving the products from the production line to storage or to the shipping platform are typical of the operations in processing plants which are included in the exemption. Removal of waste, such as clam and oyster shells, operation of processing and packing machinery, and providing steam and brine for the processing operations (see Mitchell v. Trade Winds, Inc., 289 F. 2d 278, explaining Waller v. Humphreys, 133 F. 2d 193) are also included. As for the application of the exemption to office, maintenance, warehouse, and other employees, see the discussion in § 784.106 et seq., and §§ 784.141 and 784.142.

§ 784.154 Named operations performed on previously processed aquatic products.

It will be noted that section 13(b)(4) refers to employees employed in "processing" the named aquatic commodities and not just to "first processing" as does the provision in section 13(a)(5) for such processing at sea. Accordingly, if the aquatic products, though subjected to a processing operation, are still in a perishable state, the subsequent performance of any of the enumerated operations on the still perishable products will be within the exemption no matter who the employer performing the exempt operations may be. He may be the same employer who performed the prior processing or other exempt operations, another processor, or a wholesaler, as the case may be. As noted in § 784.139(b), the Department has not questioned the applicability of the foregoing rule where the operation is performed on frozen, salted, smoked, or cured fish.

§ 784.155 Operations performed after product is rendered nonperishable.

As indicated in § 784.139, after the character of the aquatic products as taken from nature has been altered by the performance of the enumerated operations so as to render them nonperishable (e.g., drying and cleaning sponges) section 13(b)(4) provides no exemption for any subsequent operations on the preserved products, unless the subsequent operation is performed as an integrated part of the operations named in the exemption which are performed by an employer on aquatic commodities described in section 13(b)(4) after receiving them in the perishable state. In the case of an employer who is engaged in performing on perishable aquatic forms of life specified in section 13(b)(4) any operations named in that section which result in a nonperishable product, the employment of his employees in the storing, marketing, packing for shipment, or

distributing of nonperishable products resulting from such operations performed by him (including products processed during previous weeks or seasons) will be considered to be an integrated part of his operations on the perishable aquatic forms of life during those workweeks when he is actively engaged in such operations. The employees employed by him in such work on the nonperishable products are, accordingly, within the exemption in such workweeks.

§ 784.156 Operations performed on byproducts.

The principles stated in the two preceding sections would also be applicable where the specified operations are performed on perishable byproducts. Any operation performed on perishable fish scraps, an unsegregated portion of which is to be canned, would come within the canning (not the processing) part of the exemption (see § 784.148). Fish-reduction operations performed on the inedible and still perishable portions of fish resulting from processing or canning operations, to produce fish oil or meal, would come within the processing part of the exemption. Subsequent operations on the oil to fortify it would not be exempt, however, since fish oil is nonperishable in the sense that it may be held for a substantial period of time without deterioration.

MARKETING, STORING, PACKING FOR SHIPMENT, AND DISTRIBUTING

§ 784.157 General scope of named operations.

The exemption from the overtime pay requirements provided by section 13(b)(4) of the Act extends to employees "employed in the * * * marketing * * * storing, packing for shipment, or distributing of any kind of" perishable aquatic product named in the section. An employee's work must be functionally so related to the named activity as to be, in practical effect, a part of it, and the named activity must be performed with respect to the perishable aquatic commodities listed in section 13(b)(4), in order for the exemption to apply to him. The named activities include the operations customarily performed in the marketing, storing, packing for shipment, or distributing of perishable marine products. For example, an employee engaged in placing perishable marine products in boxes, cartons, crates, bags, barrels, etc., preparatory to shipment and placing the loaded containers on conveyances for delivery to customers would be employed in the "packing for shipment" of such products. Salesmen taking orders for the perishable aquatic products named in the section would be employed in the "marketing" of them. Employees of a refrigerated warehouse who perform only duties involved in placing such perishable marine products in the refrigerated space, removing them from it, and operating the refrigerating equipment, would be employed in "storing" or "distributing" such products, depending on the facts. On the other hand, employees of a public warehouse handling aquatic products which have been canned or otherwise rendered nonperishable, or handling perishable products which contain a substantial amount of ingredients not named in section 13(b)(4), would not be within the exemption. Office, clerical, maintenance, and custodial employees are not exempt by reason of the fact that they are employed by employers engaged in marketing, storing, packing for shipment, or distributing seafood and other aquatic products. Such employees are exempt only when the facts of their employment establish that they are performing functions so necessary to the actual conduct of such operations by the employer that, as a practical matter, their employment is directly and necessarily a part of the operations intended to be exempted (see, for some examples, § 784.159).

§ 784.158 Relationship to other operations as affecting exemption.

Employment in marketing, storing, distributing, and packing for shipment of the aquatic commodities described in section 13(b)(4) is, as such, exempted from the overtime pay provisions of the Act. This means that the employees actually employed in such operations on the named commodities are within the exemption without regard to the intimacy or remoteness of the relationship between their work and processing operations also performed on the commodities, so long as any prior processing has not rendered the commodity nonperishable (as in the case of a canned product) and therefore removed it from the category of marine products referred to by section 13(b)(4). If the commodity has previously been rendered nonperishable, the marketing, storing, distributing, or packing for shipment of it by an employee can come within the exemption only if the activity is one performed by his employer as an integrated part of a series of the named operations which commenced with operations on the perishable marine products to which section 13(b)(4) refers. Some examples of this situation are given in §§ 784.150 and 784.155.

§ 784.159 Activities performed in wholesale establishments.

The section 13(b)(4) exemption for employment in "marketing * * * storing, or distributing" the named aquatic products or byproducts, as applied to the wholesaling of fish and seafood, affords exemption to such activities as unloading the aquatic product at the establishment, icing or refrigerating the product and storing it, placing the product into boxes, and loading the boxes on trucks or other transportation facilities for shipment to retailers or other receivers. Transportation to and from the establishment is also included (Johnson v. Johnson & Company, Inc., N.D. Ga., 47 F. Supp. 650). Office and clerical employees of a wholesaler who perform general office work such as posting to ledgers, sending bills and statements, preparing tax returns, and making up payrolls are not exempt unless these activities can be shown to be functionally necessary, in the particular fact situation, to the actual conduct of the operations named in section 13(b)(4). Such activities as selling, taking and putting up orders, recording sales, and taking cash are, however, included in employment in "marketing" or "distributing" within the exemption. Employees of a wholesaler engaged in the performance of any of the enumerated operations on fresh fish or fish products will be engaged in exempt work. However, any such operations which they perform on aquatic products which have been canned or otherwise rendered nonperishable are nonexempt in accordance with the principles stated in §§ 784.139 and 784.158.

APPLICATION OF SECTION 13(a)(4) IN CERTAIN ESTABLISHMENTS

§ 784.160 Establishments exclusively devoted to named operations.

As noted in § 784.106 and elsewhere in the previous discussion, the section 13(b)(4) exemption depends on employment of the employee in the operations named in that section and does not apply on an establishment basis. However, the fact that an establishment is exclusively devoted to operations specified in section 13(b)(4) is, in the absence of evidence to the contrary, an indication that the employees employed there are employed in the named operations either directly or through the performance of functions so necessary to conducting the operations that the employment should in practical effect, be considered a part of the activity intended to be exempted. Where this is the case, it is consistent with the legislative intent to avoid segmentation and treat all employees of the establishment in the same manner (see Sen. Rep. No. 145, 87th Cong. 1st sess., p. 33). Accordingly, where it can be demonstrated that an establishment is, during a particular workweek, devoted exclusively to the performance of the operations named in section 13(b)(4), on the forms of aquatic life there specified, any employee of the establishment who is employed there during such workweek will be considered to be employed in such operations and to come within the exemption if there are no other facts pertinent to his employment that require a particular examination of the functions which he performs in connection with the conduct of the named operations. If, however, there are any facts (for example, the employment of the same employee at the establishment or the engagement by other employees in like duties there during periods when none of the named operations are being carried on) which raise questions as to whether he is actually engaged in the exempt activities, it will be necessary to scrutinize what he is actually doing during the conduct of the operations named in section 13(b)(4) in order to determine the applicability of the exemption to him. This is necessary because an employee who would not otherwise be within the exemption, such as a carpenter doing repair work during the dead season, does not become exempt as "employed in" one of the named activities merely because the establishment begins canning or processing fish.

Signed at Washington, D.C., this 2d day of February 1962.

CLARENCE T. LUNDQUIST,
Administrator.

Treasury Department

BUREAU OF CUSTOMS

GROUNDFISH FILLET IMPORT TARIFF-RATE QUOTA FOR 1962:

The reduced-tariff-rate import quota on fresh and frozen groundfish (cod, haddock, hake, pollock, cusk, and ocean perch) fillets and steaks for calendar year 1962 is 28,571,433 pounds, the Bureau of Customs announced in the February 10, 1961, Federal Register. Divided into quarterly quotas this means that 7,142,858 pounds of groundfish fillets and steaks during each quarter of 1962 may be imported at the 1-7/8 cents-per-pound rate of duty and any imports over the quarterly quota will be dutiable at the rate of 2-1/2 cents a pound. As of February 2, the U. S. Bureau of Customs reported that the first quarter 1962 quota of 7,142,858 at the 1-7/8-cents rate had been filled.

The reduced-rate import quota for 1962 is 12.4 percent less than the 1961 quota of 32,600,645 pounds. From 1951 to 1960 the quantity of fresh and frozen groundfish fillets permitted to enter the United States at the reduced rate of duty of 1-7/8 cents a pound had increased 24.7 percent, but in 1961 the trend was reversed significantly for the first time because in 1960 frozen fish fillet blocks with bits and pieces were no longer dutiable under the Tariff category of "frozen groundfish fillets." A further decline took place in 1962. In fact, the 1962 quota (the lowest since 1950) is 2.5 percent less than in 1951.

Reduced-Tariff-Rate Import Quota for Fresh and Frozen Groundfish Fillets, 1952-1962

Year	Quota
	1,000 Lbs.
1962	28,571
1961	32,601
1960	36,533
1959	36,920
1958	35,892
1957	37,376
1956	35,197
1955	35,433
1954	33,950
1953	33,866
1952	31,472

Average aggregate apparent annual consumption in the United States of fresh and frozen groundfish fillets and steaks (including the fillet blocks and slabs used in the manufacture of fish sticks, but excluding fish blocks since September 15, 1959, and blocks of fish bits) for the three years (1958-61) preceding 1962 was only 190,476,220 pounds, calculated in accordance with the proviso to item 717(b) of Part 1, Schedule XX, of the General Agreement on Tariff and Trade (T. D. 51802). This was less than the consumption of 217,337,633 pounds in 1958-60 and 243,554,480 pounds for 1957-59.

A decision by the United States Customs Court in 1959 held that fish blocks imported in bulk are dutiable at one cent a pound under Tariff paragraph 720(b). Prior to that decision, fish blocks were classified under paragraph 717(b), the same as fish fillets. The change became effective September 15, 1959, and fish blocks imported in bulk since that date have been classified under paragraph 720(b). Therefore, fish blocks imported since the effective date have not entered in the calculation of apparent annual consumption or the quota since only imports under 717(b) are considered in the calculation. In view of this, it is estimated that if fish blocks had remained under the 717(b) classification, apparent annual consumption for 1959-61 would have been greater than that for the previous three-year period, and also the quota for 1962 would have been greater than that for 1960 and 1961.

Note: See Commercial Fisheries Review, March 1961 p. 93.

Eighty-Seventh Congress

(Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

ANTIDUMPING ACT AMENDMENT: Introduced in House: Jan. 25, 1962, H.R. 9903 (Walter), to amend certain provisions of the Antidumping Act, 1921, to provide for greater certainty, speed, and efficiency in the enforcement thereof, and for other purposes; Jan. 31, H.R. 10021 (Walter), Feb. 7: H.R. 10057 (King), H.R. 10076 (Wharton), H.R. 10081 (Dent), and Feb. 8, H.R. 10118 (Daniel); all to the Committee on Ways and Means.

COMMERCE COMMITTEE INVESTIGATIONS IN SENATE: Investigations by the Senate Committee on Commerce, Senate Report No. 1158, Jan. 31, 1962, 10 pp., printed. Report establishes committee responsibilities, including fisheries and wildlife and marine sciences. The report delineates in broad terms the problems which confront the committee during this session of Congress. Under the Merchant Marine and Fisheries Subcommittee, the report points out: "Sports fishing and hunting continue to grow in popularity and millions of American families take advantage of these outdoor recreational pastimes--50 million Americans over 12 years of age went hunting or fishing or both in 1960. They spend over $4 billion and our businessmen and manufacturers are devoting a greater amount of effort to satisfy family needs in this recreational field. We will consider legislation to promote effectual planning, development, maintenance, and coordination of this natural resource.

"Our commercial fishery has problems. There are legislative proposals to step up fisheries research, to encourage the development of new fish products, to study the depredations of destructive predators, and to do what we can, in a legislative way, to aid and assist our state officials in conservation practices.

"In 1959 alien fleets moved into waters adjacent to Alaska. We must determine how we are to cope with this international threat to a common resource. For the committee's consideration are bills to improve and modernize our fishing fleets in order to meet our foreign competition. We must not permit the depletion of our natural resources.

"The protection of marine mammals, research and studies on effects of insecticides upon our wildlife, the preservation of bird species, and many and varied problems relating to game animals, wild fowl, and bird life demand our attention."

Under special subcommittees and studies, the report has this to say about marine sciences: "Oceanography has, and will continue to take a great deal of our time and energy. Two of our members attended the first session of the Intergovernmental Oceanographic Commission held in Paris last October. Thirty-nine nations participated. We must carefully watch the expanding oceanographic programs of other nations. We must maintain close contact with the National Academy of Sciences Committee on Oceanography, the Coordinating Committee on Oceanography, comprised of the ranking professional oceanographers of all Government agencies, with institutions and laboratories engaged in oceanographic or Great Lakes research, and with industries which recently have established laboratories for sophisticated marine studies, encouraged by the deep interest manifest by our committee and the Congress.

"The emergence of Soviet Russia as the most active of all nations in worldwide deepwater studies; the numerous resolutions adopted by the IOC at Paris relating to international ocean surveys, expeditions, communications, and weather observations; the recommendations of U. S. scientific bodies, including NASCO, and of Government departments and agencies, all present important problems within the province of this committee, many of which may require constructive legislation as well as constant vigilance."

The committee report also commented on its responsibilities as to foreign commerce, and packaging and labeling.

FEDERAL AID IN FISH RESTORATION: The Senate and House received on Feb. 19, 1962, a letter from the Secretary of the Interior, transmitting, pursuant to law, a report on activities of the Federal aid in fish restoration program, for the year ended June 30, 1961 (with an accompanying report); to the Committee on Commerce.

FISH AND WILDLIFE LEGISLATION: House Committee on Merchant Marine and Fisheries; Subcommittee on Fisheries and Wildlife Conservation on Feb. 6 and 7, 1962, held hearings on the following: H.R. 7336, to make loans to certain producers of oysters; H.R. 6529, to provide for the establishment of a new fish hatchery in the eastern part of the State of Tennessee; H.R. 8371, to construct, equip, operate, and maintain a fish hatchery in DeKalb County, Tenn.; and H.R. 2722, and identical bills, to establish a research program in order to determine means of improving the conservation of game and food fish in dam reservoirs. Heard testimony from three Congressmen on all the above bills; Department of the Interior officials reported on H.R. 7336.

FISH PROTEIN CONCENTRATE: Senator Douglas in the Senate on Feb. 6, 1962, made a statement on the U. S. Food and Drug Administration position on disapproving the sale of a fish protein concentrate made from whole fish. The statement by Senator Douglas, which appeared in the Congressional Record of Feb. 6, 1962 (p. 1664), describes fish protein concentrate or fish flour; how it is made; support of certain U. S. agencies; the Food and Drug Administration's disapproval of such a product made from whole fish; sale of other food items, and in conclusion states:

"Fish protein concentrate is important because it can help solve hunger and undernourishment in the world. People in many countries are undernourished and either cannot afford or do not have access to foods which contain sufficient proteins for their families. If we could ship fish protein concentrate to them, it could be added to their meager diets and they would thus receive the protein necessary for healthy lives.

"The low cost of the product makes it an ideal item in such programs as food for peace, United Nations food programs, and other projects designed to reduce hunger in the world. It is important because it also can be used in our own country to increase the food standards of many families at a very low cost.

"Under the restrictions by the Food and Drug Administration, the cost of this product would be so increased that those people who most need it could not afford it. The food is safe, it is pure, it is cheap, it is the best product we can offer to reduce hunger and increase world health."

Senator Proxmire endorsed Senator Douglas' statement and said in part: ". . . I recognize the very great value in using it, as the Senator has said, with rice and with bread. It is a marvelous product. It will make available to starving people all over the world food of very high nutritious value at a very low cost. . . ."

In the Senate on Feb. 8, 1962, Senator Gruening spoke on fish protein concentrate or fish flour and the Food and Drug Administration proposed standard of identity, which does not provide for manufacture of the concentrate from whole fish. He stated he had written to the Secretary of Health, Education and Welfare "protesting this proposed standard and requesting an objective hearing before a hearing examiner having no connection with that Department." The Senator's letter to the Secretary of Health, Education and Welfare was published in the Congressional Record of Feb. 8, 1962 (p. 1915).

Senator Smith on Feb. 19, 1962, presented to the Senate a preliminary report on a study on manufacturing methods of fish protein, also known as fish flour. The study, being made with a $50,000 grant given by Congress, is being conducted by Dr. E. R. Pariser of the U. S. Bureau of Commercial Fisheries.

Senator Smith pointed out that the Food and Drug Administration proposed standard of identity for fish protein makes the product expensive and lowers the nutritional value. In a letter of protest to the Secretary of Health, Education and Welfare he has asked for a proper hearing before an impartial examiner.

Dr. Pariser, in his report (which appears in the Congressional Record Feb. 19, 1962, pp. 2215-2218), stated that the over-all program set up for the 5-year research project will consist of 3 phases: (1) survey of processing methods, (2) assembly of a consulting group, and (3) laboratory developments.

The accomplishment thus far has been the completion of the first phase of the project. Plants in the United States, Canada, Central and South America were visited. The following observations were made: (1) in the United States considerable efforts have been made by a number of private industrial concerns. (2) In Canada studies are being conducted by the Technologi-

cal Station of the Canadian Fisheries Research Board in Halifax. Their program is directed toward the production of the best fish protein concentrate. (3) In South and Central America there is a most urgent need for a cheap nutritious protein supplement, suitable raw materials are available, no satisfactory process to manufacture fish protein concentrate exists, and interest in fish protein concentrate is alive in those countries.

Dr. Pariser, in conclusion, stated that once the large-scale extraction of proteins from the seas is successfully achieved it would be the beginning of a new fishing industry; it will develop as the population grows; it will rank foremost in importance with but a few other industries, capable of producing a cheap, high-quality food, available to everyone, everywhere.

HIGHWAYS AND FISH AND WILDLIFE PROTECTION: H.R. 10269 (Reuss) introduced in the House Feb. 19, 1962, to the Committee on Public Works. Would amend title 23 of the United States Code relating to highways in order to require the approval of the Secretary of the Interior to surveys, plans, specifications, and estimates for projects on the Federal-aid highway systems for the purpose of protecting fish and wildlife and recreation resources.

NORTH PACIFIC AND BERING SEA FISHERIES: On Feb. 15, 1962, the Senate received a resolution of the Senate of the State of Alaska (Alaska Senate Resolution 34) relating to the initiation of Federal studies and programs regarding the condition and exploitation of the North Pacific and Bering Sea Fisheries, referred to the Committee on Commerce. The resolution urges the Federal Government to take immediate steps to initiate projects for offshore fish and shellfish studies and the necessary oceanographic, processing, transportation, and marketing research essential to the proper implementation of the Nation's right to the beneficial exploitation of this natural resource in international waters.

NORTHWEST ATLANTIC FISHERIES CONVENTION: The Senate Committee on Foreign Relations, on Jan. 23, 1962, in open session, received testimony from Deputy Special Assistant for Fish and Wildlife, Department of State, on Ex. M (87th Cong., 1st Session) International Convention for Northwest Atlantic Fisheries (Mollusks). The Committee on the same day approved and reported to the Senate this amendment to the Convention.

The Senate, on Jan. 31, 1962, ratified the amendment. This amendment to the Convention provides for giving the Commission authority over mollusks, which were not included under the original Convention. Provides that the words "fish," "fishes," "fishery," "fisheries," and "fishing" as they appear in the original Convention include and apply to mollusks as well as finfish. This does not require House action.

OCEANOGRAPHIC RESEARCH PROGRAM: The Committee on Merchant Marine and Fisheries: Subcommittee on Oceanography met in executive session Jan. 24, 1962, on H.R. 4276, to expand and develop the aquatic resources of the United States; and S. 901, to advance the marine sciences and to establish a comprehensive 10-year program of oceanographic research. No final action was taken, and the subcommittee adjourned subject to call of the Chair.

RESEARCH: Federal Budgeting for Research and Development (Hearing before the Subcommittee on Reorganization and International Organizations of the Committee on Government Operations, United States Senate, 87th Congress, 1st Session, Agency Coordination Study Pursuant to S. Res. 26, 87th Cong., July 26 and 27, 1961, Part II), 444 pp., printed. It contains information from a Government-wide standpoint on problems of Federal budgeting for research and development, correspondence with Federal departments and agencies as regards problems unique to their particular research and development budgets, charts prepared by the subcommittee staff as part of the extensive review of Government scientific activities, and excerpts from other materials that have bearing upon Federal budgeting for research and development. One section deals directly with the U. S. Fish and Wildlife Service and presents information on the research and development programs of the Bureau of Commercial Fisheries and the Bureau of Sport Fisheries and Wildlife.

SCIENCE DEPARTMENT: S. 2771 (McClellan and others) introduced in Senate Jan. 31, 1962, to the Committee on Government Operations; for the establishment of a Commission on Science and Technology. Similar to other bills except that this bill would establish a commission whereas the others would establish a department. Would set up a Science Advisory Panel and special task forces to evaluate all Federal scientific and technological activities and related private industrial and institutional activities. Objective is for a joint legislative and executive study of Federal scientific and technical activities in order to evaluate the organization and administration of such activities and to recommend improvements in present operations, including minimizing duplication of effort, and effecting necessary reorganization.

SHELLFISH PROCESSING EXEMPTION FROM MINIMUM WAGE: Special Subcommittee on Labor of the House Committee of Education and Labor is scheduled to meet Feb. 16, 1962, on shellfish processing exemption from minimum wage.

SUBMERGED LANDS ACT: H.R. 10042 (Waggonner), introduced in House Feb. 1, 1962, to the Committee on the Judiciary, to amend the Submerged Lands Act to establish the seaward boundaries of the States of Alabama, Mississippi, and Louisiana as extending 3 marine leagues into the Gulf of Mexico and providing for the ownership and use of the submerged lands, improvements, minerals, and natural resources within said boundaries. Similar to other bills in the House and Senate during the first session of the 87th Congress.

TRADE EXPANSION ACT: Both House and Senate received message from the President (H. Doc. 314) on Jan. 25, 1962, on the Reciprocal Trade Agreements Program. Message indicated that the President was transmitting to Congress a new and modern instrument of trade negotiations--the Trade Expansion Act of 1962.

The President asked Congress for authority to "pool our resources and resourcefulness in an open trade partnership with Western Europe." He asked for broad authority to cut all tariffs up to 50 percent and to eliminate completely tariffs on products in which European-American trade amounts to 80 percent of the world total. Reductions would be spaced over the next decade. All trade concessions to the European market would be available to other free world associates, mainly Latin America and Japan. In return, the President hopes he can persuade the swiftly developing European Common Market to open up to American competition in return. The President said: "Let me emphasize that we mean

to see to it that all reductions and concessions are reciprocal--and that the access we gain is not limited by the use of quotas or other restrictive devices." The President minimized the adverse effects of increasing imports and emphasized the potential benefits from expanding exports. "Several hundred times as many workers owe their jobs directly or indirectly to exports," the President said, "as are in the small group--estimated to be less than one-half of 1 percent of all workers--who might be adversely affected by a sharp increase in imports."

The President indicated certain safeguards against injury to American industry. Escape clause relief would continue to be available with more up-to-date definitions. Temporary tariff relief will be granted where essential. And the four basic stages of the traditional peril point procedures and safeguards will be retained and improved.

Government should stand ready to aid farm and factory workers and companies temporarily hurt. He proposed these as "effective and relatively inexpensive" measures. For workers left idle--financial help for job retraining and relocation, along with Federal "readjustment allowances" for up to a full year at 65 percent of average weekly pay, plus an additional 13 weeks for those over 60. For business firms and farmers--Federal loans and loan guarantees, technical guidance, and "tax benefits" to help companies modernize plants and diversify products.

The President stated, "This cannot be and will not be a subsidy program of government paternalism. It is instead a program to afford time for American initiative, American adaptability, and American resiliency to assert themselves. It is consistent with that part of the proposed law which would stage tariff reductions over a 5-year period. Accordingly, trade adjustment assistance, like the other provisions of the Trade Expansion Act of 1962, is designed to strengthen the efficiency of our economy, not to protect inefficiencies. Authority to grant temporary tariff relief will remain available to assist those industries injured by a sudden influx of goods under revised tariffs. But the accent is on adjustment more than assistance. Through trade adjustment prompt and effective help can be given to those suffering genuine hardship in adjusting to import competition, moving men and resources out of uneconomic production into efficient production and competitive positions, and in the process preserving the employment relationships between firms and workers wherever possible. Unlike tariff relief, this assistance can be tailored to their individual needs without disrupting other policies. . . ."

H.R. 9900 (Mills) introduced in House Jan. 25, 1962, to the Committee on Ways and Means; to promote the general welfare, foreign policy, and security of the United States through international trade agreements and through adjustment assistance to domestic industry, agriculture, and labor, and for other purposes. This would implement the Administration's new trade policy and would be known as the Trade Expansion Act of 1962.

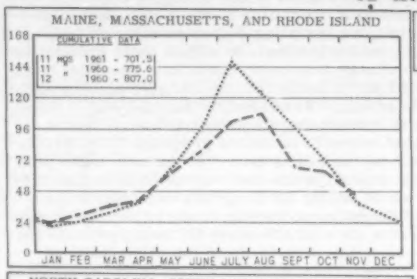
S. 2840 (Javits) introduced in Senate Feb. 15, 1962, to the Committee on Finance; to provide authority for the President, under the control and direction of the Congress, to make such necessary adjustments in the trade policies of the United States as may be necessary to meet the complex and rapidly changing economic and political conditions prevailing in the world, and to provide the means for assisting domestic enterprises, communities, and individuals to adjust their productive activities to change economic conditions resulting from the increased participation of the United States in world trade. Title of bill, "Trade Policy Act of 1962." Senator Javits in introducing the bill pointed out that it is an alternative to the President's program (H.R. 9900). The approach of the bill is that: (1) the new trade policy must be confined to the item-by-item or commodity concept of world trade; (2) Congress must participate in the broad direction of foreign trade policy and must be able to make its will effective; (3) would provide for congressional policy directions in the utilization of Presidential negotiating authority and for congressional veto power over the most important phases of the exercise of Presidential authority; (a) trade agreements, (b) national security proclamations, (c) escape clause actions, and (d) adjustment assistance administration. The Senator stated that the reason for introducing this alternative legislation is that the United States must take the leadership in forging a unified free world trading policy toward the Soviet bloc.

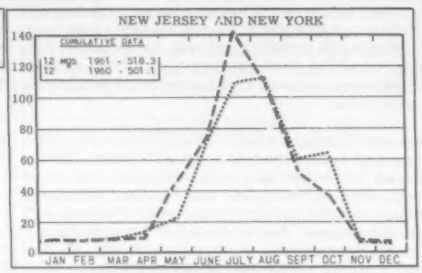
Foreign Economic Policy for the 1960's: Report of the Joint Economic Committee to the Congress of the United States with Minority and Other Views, 57 pp., printed, 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., 20 cents a copy.) Contains a discussion of the United States trade policy, trade relations with third countries, East-West trade, objections of foreign policy in the 1960's, the need for a new kind of bargaining authority, safeguards and trade policy, and our economic policies. Also contains statements from several Senators.

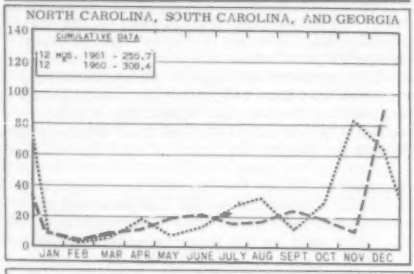
VESSEL SUPPLIES EXEMPT FROM DUTIES: S. 2674 (Curtis), introduced in Senate Jan. 15, 1962, a bill to amend section 309 (a) (1) (B) of the Tariff Act of 1930, as amended, to the Committee on Finance. Proposes to exempt, from duties and internal revenue taxes, supplies (not including equipment) for vessels of the United States engaged in coastwise trade. This exemption applies to vessels engaged in fisheries.

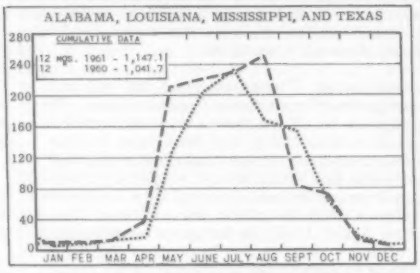
CHART 1 - FISHERY LANDINGS for SELECTED STATES

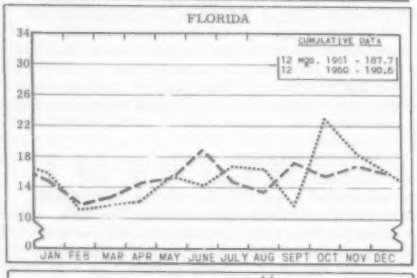
In Millions of Pounds

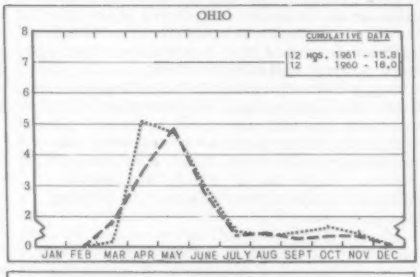

MAINE, MASSACHUSETTS, AND RHODE ISLAND
CUMULATIVE DATA
11 MOS. 1961 - 701.5
11 " 1960 - 775.6
12 " 1960 - 807.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

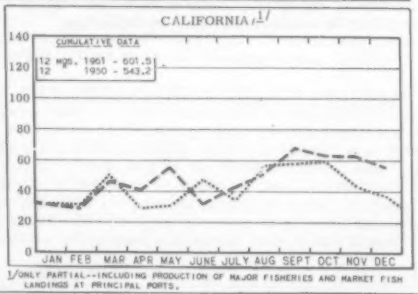


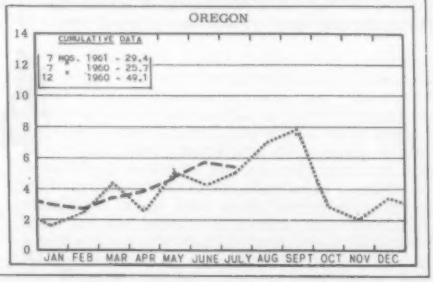

NORTH CAROLINA, SOUTH CAROLINA, AND GEORGIA
CUMULATIVE DATA
12 MOS. 1961 - 259.7
12 " 1960 - 308.4
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


ALABAMA, LOUISIANA, MISSISSIPPI, AND TEXAS
CUMULATIVE DATA
12 MOS. 1961 - 1,147.1
12 " 1960 - 1,041.7
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC





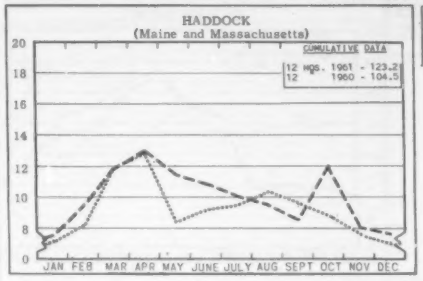


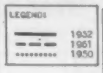


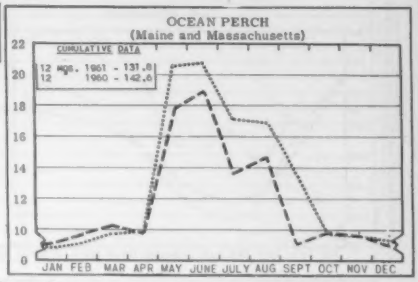
1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

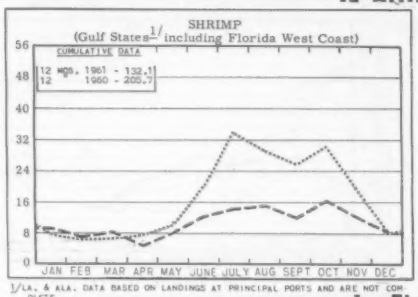
In Millions of Pounds


HADDOCK
(Maine and Massachusetts)
CUMULATIVE DATA
12 MOS. 1961 - 123.2
12 " 1960 - 104.5
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

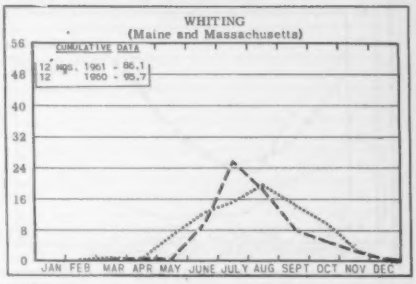



OCEAN PERCH
(Maine and Massachusetts)
CUMULATIVE DATA
12 MOS. 1961 - 131.8
12 " 1960 - 142.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

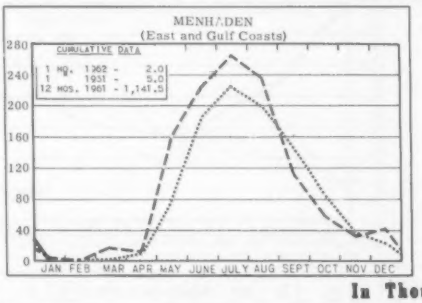
In Millions of Pounds

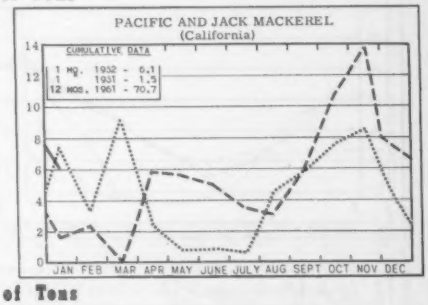

SHRIMP
(Gulf States 1/ including Florida West Coast)
CUMULATIVE DATA
12 MOS. 1961 - 132.1
12 " 1960 - 205.7
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

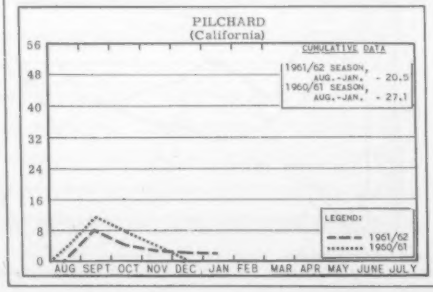

WHITING
(Maine and Massachusetts)
CUMULATIVE DATA
12 MOS. 1961 - 86.1
12 " 1960 - 95.7
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

In Thousands of Tons


MENHADEN
(East and Gulf Coasts)
CUMULATIVE DATA
1 MO. 1962 - 2.0
1 " 1961 - 5.0
12 MOS. 1961 - 1,141.5
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


PACIFIC AND JACK MACKEREL
(California)
CUMULATIVE DATA
1 MO. 1962 - 6.1
1 " 1961 - 1.5
12 MOS. 1961 - 70.7
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

In Thousands of Tons



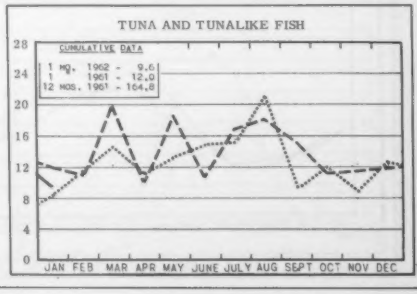
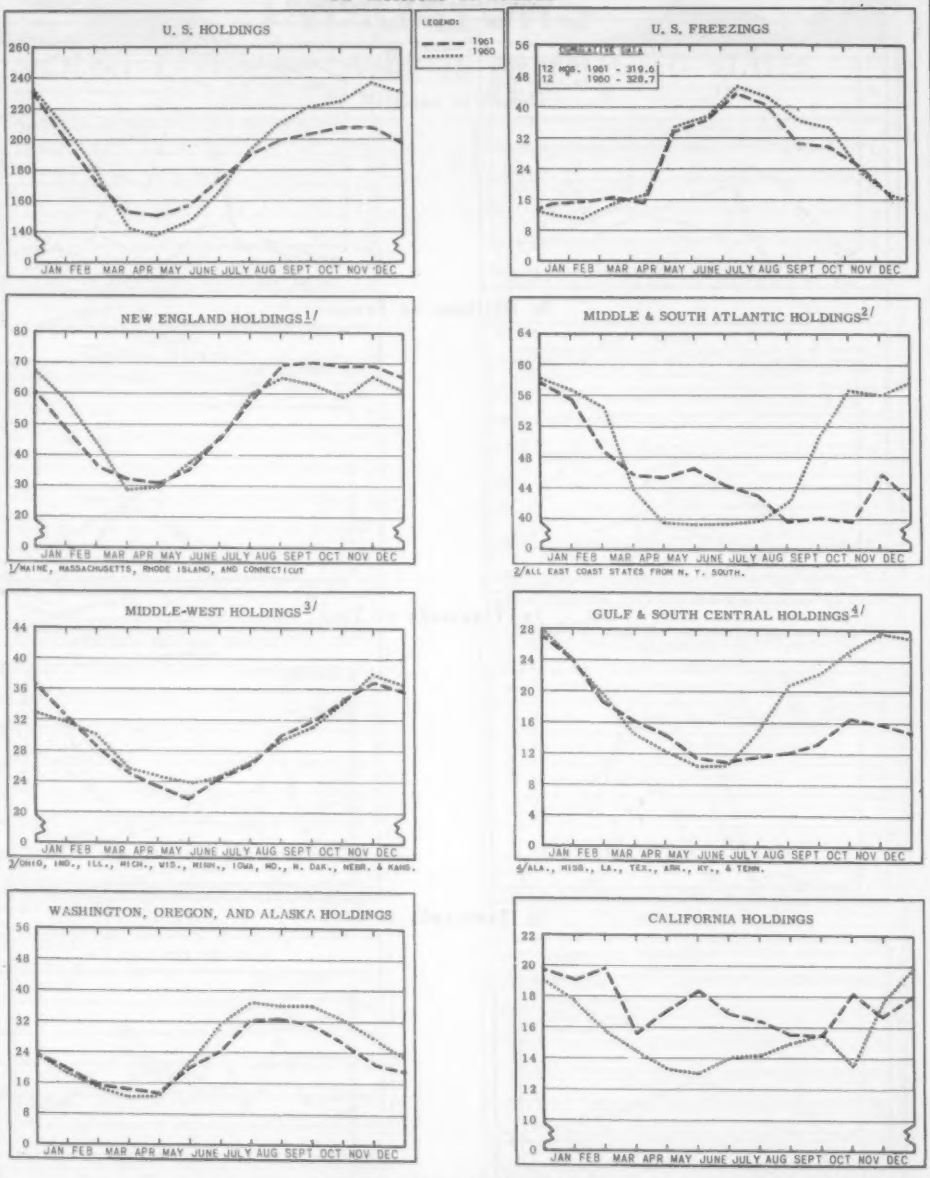

TUNA AND TUNALIKE FISH
CUMULATIVE DATA
1 MO. 1962 - 9.6
1 " 1961 - 12.0
12 MOS. 1961 - 164.8
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds



1/MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT

2/ALL EAST COAST STATES FROM N. Y. SOUTH.

3/OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.

4/ALA., MISS., LA., TEX., ARK., KY., & TENN.

* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

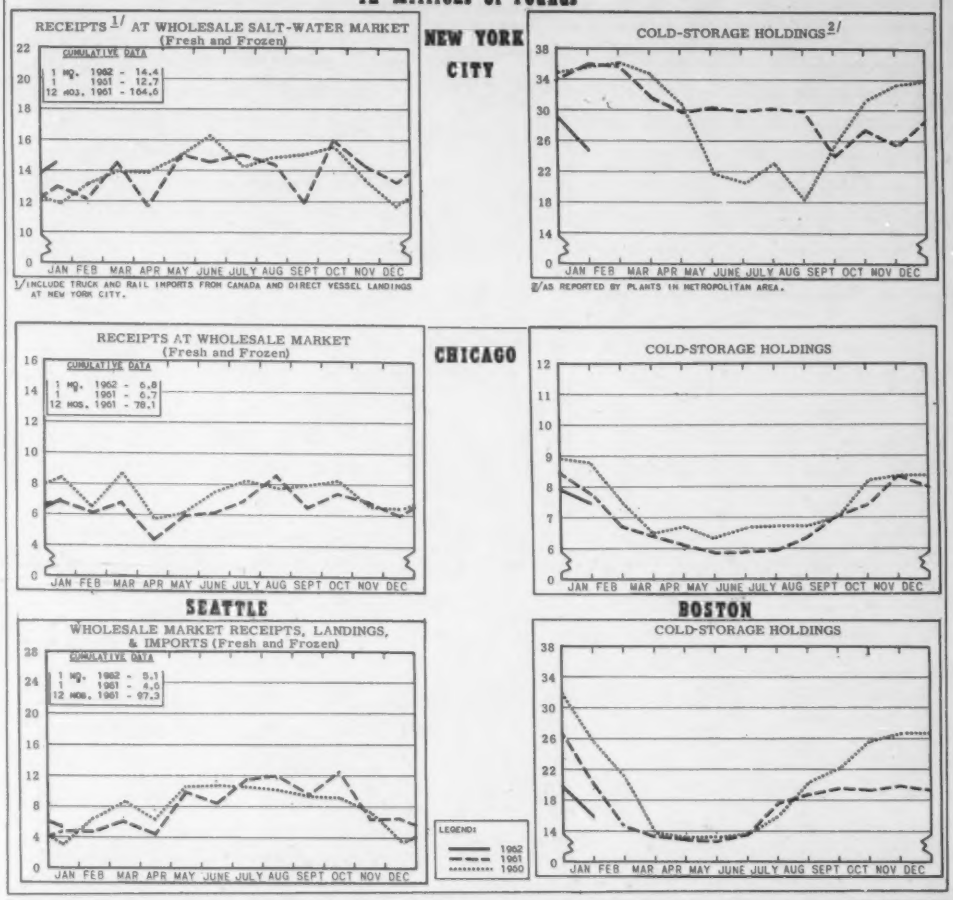

RECEIPTS 1/ AT WHOLESALE SALT-WATER MARKET
(Fresh and Frozen)
CUMULATIVE DATA
1 MO. 1962 - 14.4
1 1961 - 12.7
12 MOS. 1961 - 164.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
1/INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.
NEW YORK CITY
COLD-STORAGE HOLDINGS 2/
2/AS REPORTED BY PLANTS IN METROPOLITAN AREA.
RECEIPTS AT WHOLESALE MARKET
(Fresh and Frozen)
CUMULATIVE DATA
1 MO. 1962 - 6.8
1 1961 - 6.7
12 MOS. 1961 - 78.1
CHICAGO
COLD-STORAGE HOLDINGS
SEATTLE
WHOLESALE MARKET RECEIPTS, LANDINGS, & IMPORTS (Fresh and Frozen)
CUMULATIVE DATA
1 MO. 1962 - 9.1
1 1961 - 4.0
12 MOS. 1961 - 97.3
BOSTON
COLD-STORAGE HOLDINGS
LEGEND:
1962
1961
1950

CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA

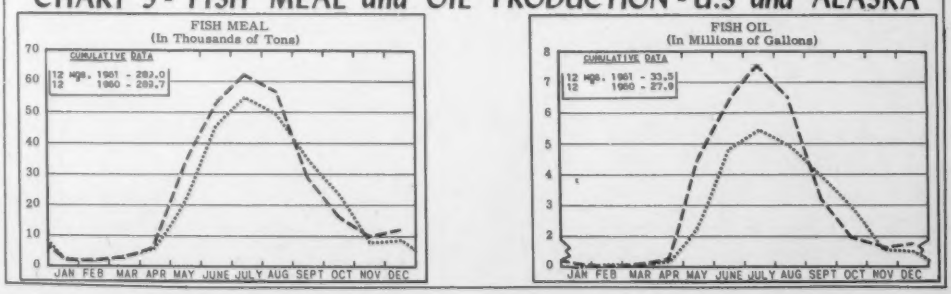
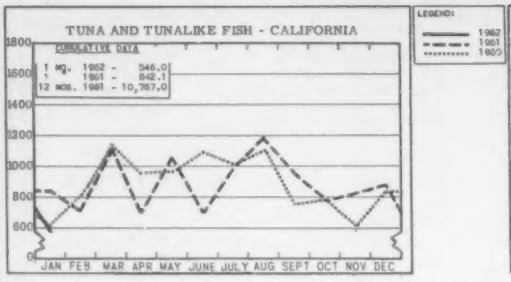
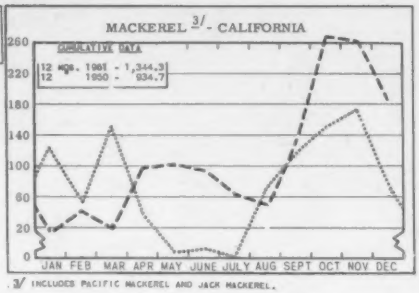

FISH MEAL
(In Thousands of Tons)
CUMULATIVE DATA
12 MOS. 1961 - 282.0
12 1960 - 289.7
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
FISH OIL
(In Millions of Gallons)
CUMULATIVE DATA
12 MOS. 1961 - 33.5
12 1960 - 27.9

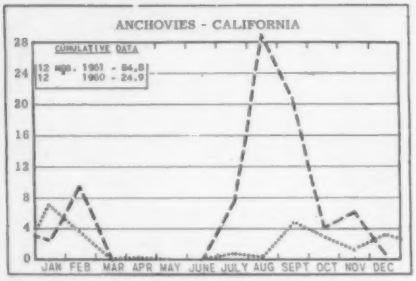
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

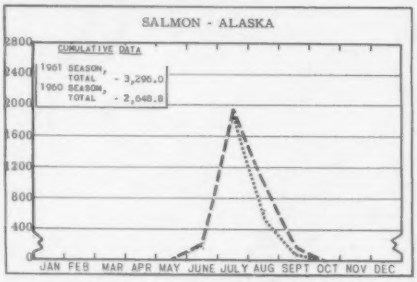
In Thousands of Standard Cases

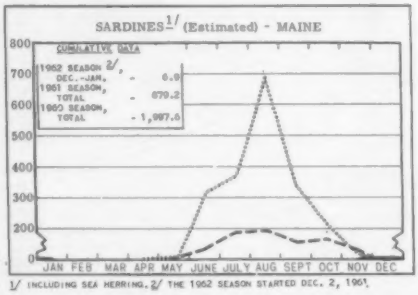




3/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



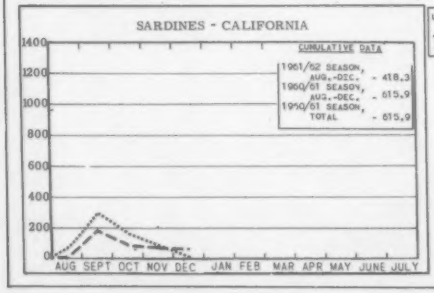

SALMON - ALASKA
CUMULATIVE DATA
1961 SEASON, TOTAL - 3,296.0
1960 SEASON, TOTAL - 2,648.8
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


SARDINES 1/ (Estimated) - MAINE
CUMULATIVE DATA
1962 SEASON 2/, DEC.-JAN. - 6.9
1961 SEASON, TOTAL - 679.2
1960 SEASON, TOTAL - 1,997.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/ INCLUDING SEA HERRING. 2/ THE 1962 SEASON STARTED DEC. 2, 1961.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	¼ drawn	3¾ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# ½ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	½-lb.	8 oz.



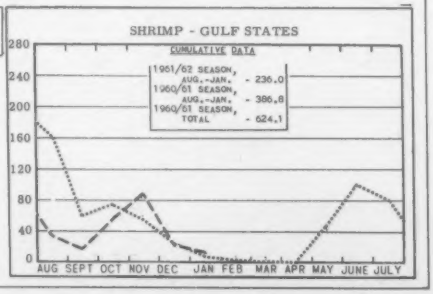
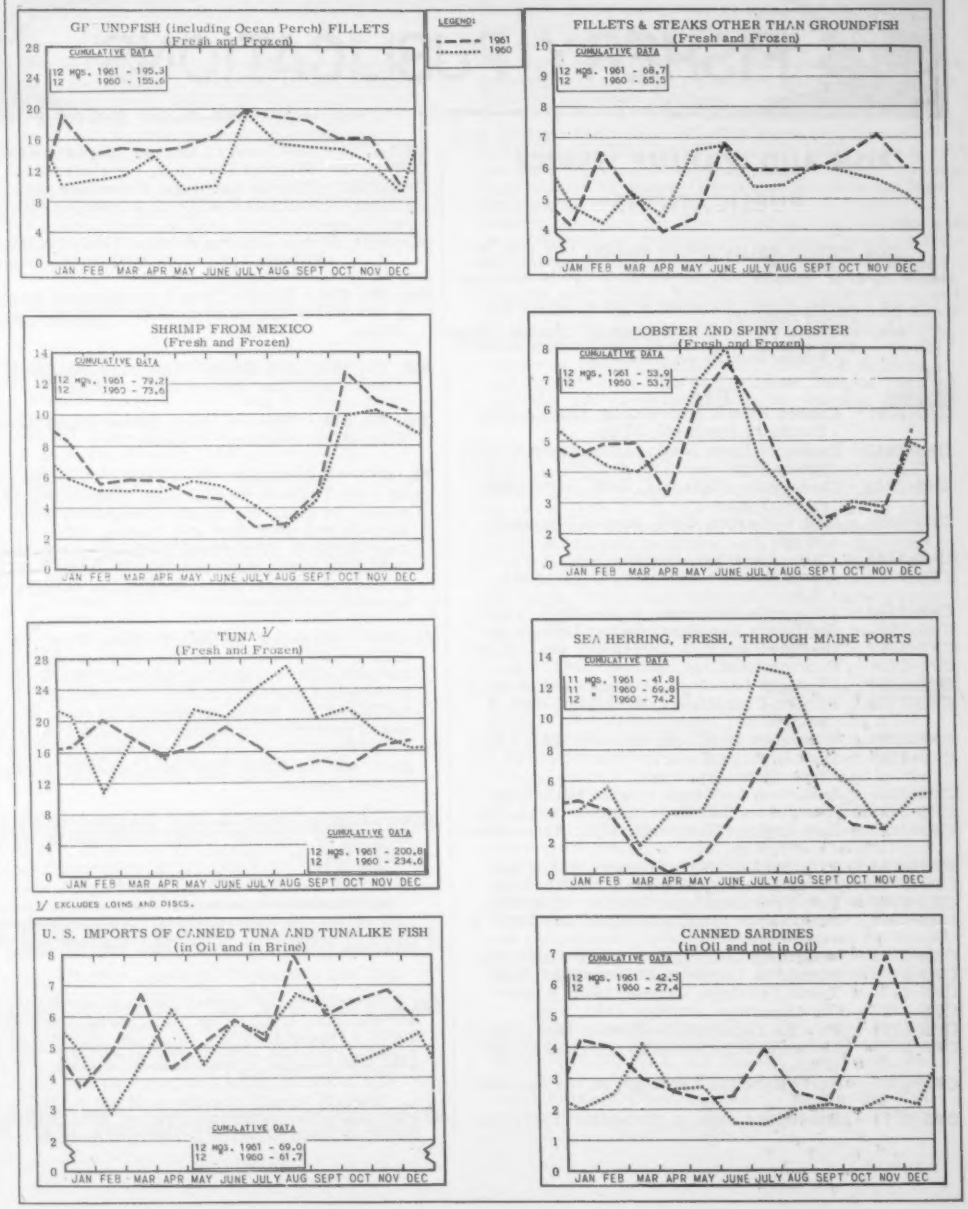
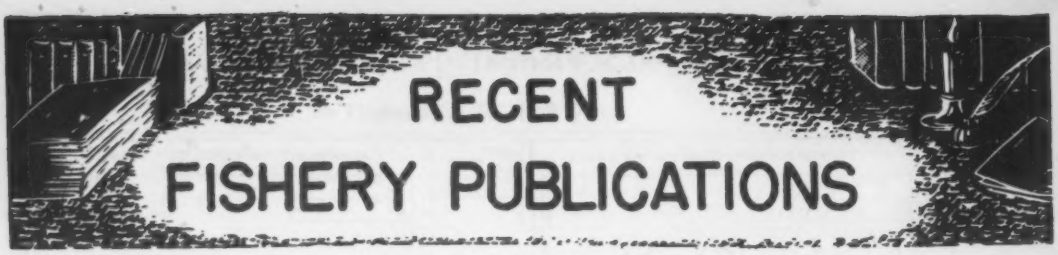

SHRIMP - GULF STATES
CUMULATIVE DATA
1961/62 SEASON, AUG.-JAN. - 236.0
1960/61 SEASON, AUG.-JAN. - 386.8
1960/61 SEASON, TOTAL - 624.1
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY

CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds


GROUNDFISH (including Ocean Perch) FILLETS
(Fresh and Frozen)
CUMULATIVE DATA
12 MOS. 1961 - 195.3
12 " 1960 - 199.6
LEGEND:
1961
1960
FILLETS & STEAKS OTHER THAN GROUNDFISH
(Fresh and Frozen)
CUMULATIVE DATA
12 MOS. 1961 - 68.7
12 " 1960 - 65.5
SHRIMP FROM MEXICO
(Fresh and Frozen)
CUMULATIVE DATA
12 MOS. 1961 - 79.2
12 " 1960 - 73.6
LOBSTER AND SPINY LOBSTER
(Fresh and Frozen)
CUMULATIVE DATA
12 MOS. 1961 - 53.9
12 " 1960 - 53.7
TUNA 1/
(Fresh and Frozen)
CUMULATIVE DATA
12 MOS. 1961 - 200.8
12 " 1960 - 234.6
1/ EXCLUDES LOINS AND DISCS.
SEA HERRING, FRESH, THROUGH MAINE PORTS
CUMULATIVE DATA
11 MOS. 1961 - 41.8
11 " 1960 - 69.8
12 " 1960 - 74.2
U. S. IMPORTS OF CANNED TUNA AND TUNALIKE FISH
(in Oil and in Brine)
CUMULATIVE DATA
12 MOS. 1961 - 69.0
12 " 1960 - 61.7
CANNED SARDINES
(in Oil and not in Oil)
CUMULATIVE DATA
12 MOS. 1961 - 42.5
12 " 1960 - 27.4
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC



FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SL - BRANCH OF STATISTICS LIST OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.

Number Title

CFS-2541 - Canned Fish & Pyproducts, 1960, Annual Summary (revised), 22 pp.
CFS-2542 - Packaged Fish, 1960, Annual Summary (revised), 5 pp.
CFS-2685 - Chesapeake Fisheries, 1960, Annual Summary, 7 pp.
CFS-2694 - Gulf Fisheries, 1960, Annual Summary, 10 pp.
CFS-2746 - Maine Landings, October 1961, 3 pp.
CFS-2747 - Massachusetts Landings, August 1961, 5 pp.
CFS-2750 - California Landings, August 1961, 3 pp.
CFS-2752 - California Landings, August 1961, 3 pp.
CFS-2753 - Georgia Landings, September 1961, 2 pp.
CFS-2754 - Georgia Landings, October 1961, 2 pp.
CFS-2757 - Michigan Landings, October 1961, 2 pp.
CFS-2758 - Frozen Fish Report, November 1961, 8 pp.
CFS-2759 - Wisconsin Landings, October 1961, 2 pp.
CFS-2760 - Manufactured Fishery Products, 1960, Annual Summary, 7 pp.
CFS-2761 - Louisiana Landings, August 1961, 2 pp.
CFS-2762 - New Jersey Landings, October 1961, 4 pp.
CFS-2763 - New England Fisheries, 1960, Annual Summary, 8 pp.
CFS-2764 - Virginia Landings, October 1961, 4 pp.
CFS-2765 - Texas Landings, September 1961, 3 pp.
CFS-2766 - New York Landings, October 1961, 5 pp.
CFS-2768 - Mississippi Landings, September 1961, 2 pp.
CFS-2769 - Wisconsin Landings, November 1961, 2 pp.
CFS-2770 - Minnesota Landings, October 1961, 2 pp.
CFS-2771 - Texas Landings, October 1961, 3 pp.
CFS-2772 - Ohio Landings, October 1961, 2 pp.
CFS-2774 - Georgia Landings, November 1961, 2 pp.
CFS-2775 - South Carolina Landings, November 1961, 2 pp.
CFS-2776 - North Carolina Landings, November 1961, 4 pp.
CFS-2777 - Maryland Landings, November 1961, 3 pp.
CFS-2778 - New Jersey Landings, November 1961, 4 pp.
CFS-2779 - Virginia Landings, November 1961, 4 pp.
CFS-2782 - Florida Landings, November 1961, 9 pp.
CFS-2784 - Fish Meal and Oil, November 1961, 2 pp.

SL-101 - Firms Canning Salmon, 1960 (Pacific Coast States), 3 pp.

Sep. No. 639 - Bluefin Tuna Concentration Found During a Long-Line Exploration of the Northwestern Atlantic Slope.

Sep. No. 640 - The Composition of Shrimp Meal Made From Fresh and Spoiled Shrimp Heads.

Sep. No. 641 - Oysters: Long Island Sound Spawning and Setting Observations, Summer 1961.

FL-524 - Cephalopods: Cuttlefish, Octopuses, Squids, by Lola T. Dees, 10 pp., illus., September 1961. Discusses in detail the physical characteristics of cephalopods and their food and feeding, locomotion, and reproduction. Describes the familiar cephalopods--cuttlefish, octopuses, and squids; their enemies and protection against them; methods of capture; and commercial utilization.

FL-526 - Sturgeons, by Lola T. Dees, 8 pp., illus., September 1961. Describes the physical appearance of the sturgeon, the species, physical characteristics, feeding and spawning habits, development of the young, decline of the stocks, protection in some states, methods of capture, and commercial value. Also discusses the preparation of caviar and isinglass; culture of sturgeon; and the North American, Asiatic, European, and related species.

Illustrations in Publications of the Fish and Wildlife Service, by Faxon W. Cook, Circular 116, 23 pp., illus., 1961.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE NOT FOR GENERAL DISTRIBUTION BUT ARE AVAILABLE FOR REFERENCE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

Egg Development and Larval Stages of the Dolphin, by Satoshi Mito, 6 pp., illus., processed, December 1961. (Translated from Japanese, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, no. 3, 1960, pp. 223-226.)

On the Frequency Characteristics of Sea Noise and Fish School Sounds, by Minoru Nishimura, 12 pp., illus.,

processed. (Translated from Japanese, Technical Report of Fishing Boat, No. 15, March 1961, pp. 111-118.)

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

The Distribution of Plankton in the Pacific Ocean and its Relation to Geographical Zonation, by V. G. Bogorov, K. V. Beklemishev, and M. E. Vinogradov, 7 pp., illus., processed, January 1962. (Translation from Russian, 10th Pacific Science Congress, Honolulu, Hawaii, August 1961.)

On the Transformation of Plankton in the North Pacific Current and Adjacent Waters, by C. W. Beklemishev, 4 pp., illus., processed, January 1962. (Translation from Russian, 10th Pacific Science Congress, Honolulu, Hawaii, August 1961.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, November 1961, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, November 1961, 17 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, sardines, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; Oregon and Washington receipts (domestic and imports) of fresh and frozen tuna and tunalike fish; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, November 1961, 7 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, December 1961, 11 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; and sponge sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, December 1961, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, November and December 1961, 24 pp., each. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the months indicated.

New York City's Wholesale Fishery Trade--Monthly Summary, September 1961, 26 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and freshwater sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, December 1961, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

Efficiency Evaluation, Tracy Fish Collecting Facility, Central Valley Project, California, by Daniel W. Bates, Orren Logan, and Everett A. Pesonen, 98 pp., illus., processed, October 1960. (U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Pacific Region, 6116 Arcade Bldg., 1319 Second Ave., Seattle 1, Wash.)

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Effects of Copper Ore on the Ecology of a Lagoon, by Kenneth T. Marvin, Larence M. Lansford, and Ray S. Wheeler, Fishery Bulletin 184 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), 12 pp., illus., printed, 15 cents, 1961.

"Normal Behavior of Chinook Salmon Fingerlings," by Roger E. Burrows, article, The Progressive Fish-Culturist, vol. 23, no. 1, 1961, p. 7, processed.

"A Staining Method for Marking Large Numbers of Small Fish," by James E. Deacon, article, Progressive Fish-Culturist, vol. 23, no. 1, 1961, pp. 41-42, processed.

"Trout Hepatoma--a Preliminary Report," by R. R. Rucker, W. T. Yasutake, and H. Wolf, article, Progressive Fish-Culturist, vol. 23, no. 1, 1961, pp. 3-7, processed.

"An Underwater Camera Case," by John L. Wagner and W. L. Hartman, article, Progressive Fish-Culturist, vol. 22, no. 4, 1960, pp. 188-191, processed.

Validity of Age Determination from Scales of Marked American Shad, by Mayo H. Judy, Fishery Bulletin 185 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), 14 pp., illus., printed, 15 cents, 1961.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALASKA:
1960 Alaska Commercial Fisheries Catch & Production Statistics, by Philip E. Chitwood, Statistical Leaflet No. 1, 20 pp., processed. Contains statistical tables showing fisheries operating units by region, catch summary, catch and value to fishermen by region and by gear, salmon catch by gear and region in numbers of fish, and salmon catch by district in numbers of fish. Tables also show 1958-60 average weight of salmon; transporting, wholesaling, and manufacturing; summary of products as prepared for market; and production of canned products in standard cases.

ANTIBIOTICS:
"The Ice-Antibiotic Treatment in the Preservation of Some Seafood Products," by C. Mateu and G. Varela. Chemical Abstracts, vol. 55, 3867a, February 20, 1961.

AUSTRALIA:
Annual Report for Year Ending June 30, 1961, 33 pp., illus., processed. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Cronulla, Australia. Covers activities of the Division of Fisheries and Oceanography, its cooperation with other institutions, and operation of research vessels. Also covers activities in physical oceanography, hydrology, chemical analysis of sea water, zooplankton research, biochemistry, phytoplankton, bacteriology, benthos sampling, and marine fouling; fisheries oceanography, fish taxonomy, and fisheries biology.

BIBLIOGRAPHY:
A Bibliography--Effects of External Forces on Aquatic Organisms, by Frank J. Schwartz, Contribution No. 168, 88 pp., printed. Chesapeake Biological Laboratory, Solomons, Md., January 1961.

BLOOD OF FISH:
Distribution of Some Blood Constituents in Fishes from the Gulf of Mexico, by L. L. Sulya, B. E. Box, and Gordon Gunter, 4 pp., printed. (Reprinted from The American Journal of Physiology, vol. 199, no. 6, December 1960, pp. 1177-1180.) American Physiological Society, 9650 Wisconsin Ave. NW., Washington 14, D. C.

Some Evolutionary Patterns in Fishes' Blood, by Gordon Gunter, L. L. Sulya, and B. E. Box, 5 pp., printed. (Reprinted from Biological Bulletin, vol. 121, no. 2, October 1961, pp. 302-306.) Marine Biological Laboratory, Woods Hole, Mass.

BLUE CRABS:
"A Blue Blue Crab," by Paul A. Haefner, Jr., article Estuarine Bulletin, vol. 6, nos. 3 and 4, December 1961, pp. 3-5, illus., printed. Estuarine Bulletin, University of Delaware, Department of Biological Sciences, Newark, Del. Discusses the finding of a pale-blue-colored blue crab on a Delaware beach. Explains the various types of pigments found in crustaceans and the probable causes of the unique color of that particular specimen.

BRAZIL:
Sudene, Boletim de Estudos de Pesca, vol. 1, no. 1, October 1961, 22 pp., illus., processed in Portuguese. Sudene, Boletim de Estudos de Pesca, Superintendencia do Desenvolvimento do Nordeste, Departmento de Estudos Especiais, Recife, Brazil. Included in this issue are articles on a development program for maritime fisheries of northeast Brazil, biological studies on the commercial spiny lobsters of Recife, and the tuna fishery in tropical Atlantic exploratory areas.

BROWNING:
"Studies on the Browning of Fish Flesh. IV--Browning of Sugar with Certain Amino Acids by Heat," by Fumio Nagayama, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, January 1961, pp. 28-33, printed. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

BUFFALOFISH:
"Propagation of Buffalo Fishes," by Lee Brady and Andrew Hulsey, article, Proceedings of the Thirteenth Annual Conference, Southeastern Association of Game and Fish Commissioners, pp. 80-90, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1959.

BUOYS:
A Technical Report of Research in Marine Science in Connection with Buoy Instrumentation Conducted during the Period 1 April 1960 to 31 March 1961, 28 pp., illus., processed. Fisheries Instrumentation Laboratory, Houghton, Wash.

CALIFORNIA:
"The Californian Market for Fish," by Charles S. Collins, article, Foreign Trade, vol. 116, no. 13, Decem-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

ber 16, 1961, pp. 10-11, printed, single copy 20 Canadian cents. Queen's Printer, Government Printing Bureau, Ottawa, Canada. Canada shipped 68 varieties of fish and byproducts valued at nearly $3 million to California in 1959. These products included frozen Pacific halibut and coho salmon, frozen whitefish, pickled herring, kippers, finnan haddies, and smoked cod fillets. Despite large landings of fish and shellfish in California, imports of fishery products increased in 1960. According to the author, California continued to lead all other states in the pack of canned pet food made from fisheries products.

CANADA:

The Fisheries Problems Associated with the Power Development of the Puntledge River, Vancouver Island, B. C., 183 pp., illus., processed. Department of Fisheries, Vancouver, B. C., Canada, October 1958.

Fisheries Statistics of Canada, 1960 (Alberta and Northwest Territories), 21 pp., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1961. Contains tables giving the value of the principal species of fish landed in Alberta, 1953-1960; and the quantity and value of fish landed by fisheries districts, 1959-1960. Also contains tables showing value of fishery products by species in the Northwest Territories, 1953-1960; quantity and value of fishery products by species, 1959-60; capital equipment used in the primary fishery operations; and the number of persons engaged in the fisheries.

Fisheries Statistics of Canada, 1960 (Manitoba), 9 pp., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1961. Contains tables giving the value of fishery products by species in Manitoba, 1953-1960; quantity and value of landings by species and fisheries districts, 1959-60; quantity and value of fishery products by species, 1959-60; capital equipment used in the primary fishery operations; and the number of persons engaged in the fisheries.

Fisheries Statistics of Canada, 1960 (Ontario), 9 pp., illus., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1961. Contains tables giving the value of fishery products by species in Ontario, 1953-1960; quantity and value of landings by species and fisheries districts, 1959-60; capital equipment used in the primary fisheries operations; and the number of persons engaged in the fisheries.

Fishes of the Pacific Coast of Canada, by W. A. Clemens and G. V. Wilby, Bulletin No. 68, 2nd Edition, printed, C$5. Fisheries Research Board of Canada, Ottawa, Canada, 1961. (For sale by the Queen's Printer and Controller of Stationery, Ottawa, Canada.) The composition of the marine fish fauna of the Pacific coast of Canada is extremely varied. A few northern, or arctic, fish have their southern limits of distribution on the British Columbia coast, and on the other hand certain southern pelagic forms tend to reach a northern limit. During the past few years some unusual fish known mostly from other oceans have been found, and several unique fish living at great depths along the coast have become known. The fact that the 272 species recorded in this volume belong in 83 families indicates something of the varied character of the fish in this area.

CATCH RATE:

"Catch Curves and Mortality Rates," by D. S. Robson and D. G. Chapman, article, Transactions of the American Fisheries Society, vol. 90, no. 2, 1961, pp. 181-189, printed. Librarian, Colorado A & M College, Fort Collins, Colo.

"Measurement of Potential Fishing Quality," by Robert S. Rupp, article, Transactions of the American Fisheries Society, vol. 90, no. 2, 1961, pp. 165-169, printed. Librarian, Colorado A & M College, Fort Collins, Colo.

CAVIAR:

"Bites of Caviar Mean Tons of Unwanted Sturgeon," article, Food Manufacture, vol. 36, April 1961, pp. 134-135, printed. Food Manufacture, Leonard Hill, Ltd., Stratford House, 9 Eden St., London NW1, England.

CODLING:

"Changes in Sugar Phosphates of Chilled Codling (Gadus callarias) Muscle," by J. R. Burt and N. R. Jones, article, Journal of the Science of Food and Agriculture, vol. 12, April 1961, pp. 344-347, printed. Journal of the Science of Food and Agriculture, Society of Chemical Industry, 14 Belgrave Square, London SW1, England.

DEODORIZATION:

"Deodorized Fish Products," by Ezra Levin. Chemical Abstracts, vol. 55, 11701d, June 12, 1961.

DOGFISH:

"Comments on the Smooth Dogfish, Mustelus canis, from Chesapeake Bay, Maryland," by Frank J. Schwartz, article, Chesapeake Science, vol. 1, no. 2, 1960, pp. 124-125, printed. Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

DRIFT NETS:

"Ob Izmenenii Vysoty Drifternoi Seti pri Dreife (On Changes in Height of a Driftnet in Wind), by A. M. Karpelianskii, article, Rybnoe Khoziaistvo, vol. 35, no. 12, 1959, pp. 39-42, illus., printed in Russian. VNIRO, Glavniproekta, pri Gosplanie, SSSR, Moscow, U.S.S.R

EELS:

The Freshwater Eels (ANGUILLA spp.) of Southern Africa. An Introduction to Their Identification and Biology, by R. A. Jubb, illus., printed. (Reprinted from Annals of the Cape Provincial Museums, March 1961.) Albany Museum, Grahamstown, South Africa Republic.

ELECTRICAL FISHING:

"Bibliographie uber die Elektrofischerei und Ihre Grundlagen" (Bibliography on Electrical Fishing and Its Fundamentals), by P. F. Meyer-Waarden, Egon Halsband, and Inge Halsband, article, Archiv

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

fur Fischereiwissenschaft, vol. 11, no. 1, 1960, 104 pp., printed in German. Bundesforschungsanstalt fur Fischerei, Hamburg, Germany.

A Note on the Effect of Electric Fields on GADUS VIRENS, by Olav Dragesund and Helge Leivestad, Fiskeridirektoratets Skrifter, Serie Havundersokelser, vol. XII, no 4, 7 pp., illus., printed. A. S. John Griegs Boktrykkeri, Bergen, Norway, 1959.

EUROPE:
"Probable Development of Fish Industries in Europe during the Future 20 Years," by M. B. F. Ranken, article, Peche Maritime, no. 993, December 1960, pp. 807-817, illus., printed in French. Peche Maritime, 190 Boulevard Haussmann, Paris 8, France.

FACTORYSHIPS:
"A Plant for the Freezing of Whalemeat on Board a Modern Factoryship," by E. Hofmann, article, Linde Ber., Germ., No. 10, November 1960, pp. 8-11, printed. Abstract 9498, Bulletin de L'Institut International du Froid, vol. 41, No. 2, 1961. International Institute of Refrigeration, 177 Blvd. Malesherbes, Paris 17, France.

FATTY ACIDS:
"Distribution and Function of Essential Fatty Acids in Mitochondria," by Richardson, Tappel, and Gruger, article, Archives of Biochemistry and Biophysics, vol. 94, no. 1, July 1961, pp. 1-6, printed. Archives of Biochemistry and Biophysics, Academic Press Inc., 111 5th Ave., New York 3, N. Y.

FISH BEHAVIOR:
"Studies on the Swimming Noise of the Fish," by Michio Uno and Tuneo Konagaya, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, no. 11, 1960, pp. 1069-1073, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

Symposium on Fish Behaviour, Proceedings of the Indo-Pacific Fisheries Council, 1958, 116 pp., printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Bangkok, Thailand, 1960.

FISH FACILITIES:
"The Fish Facilities at the Whitehorse Rapids Power Development, Yukon Territory," by R. N. Gordon, R. A. Crouter, and J. S. Nelson, article, The Canadian Fish Culturist, no. 27, August 1960, pp. 43-56, printed. The Canadian Fish Culturist, Information and Educational Service, Department of Fisheries, Ottawa, Canada.

FISH-LIVER OIL:
"Alkali Digestion for Producing Vitamin Oil from Fish Liver," by Hideo Higashi, Yaichiro Shimma and Hisako Taguchi. Chemical Abstracts, vol. 55, 8769h, May 1, 1961.

"Prevention of the Injurious Effects of Excessive Cod-Liver Oil by its Fortification with Vitamin E," by T. Moore and I. M. Sharman, article, British Journal of Nutrition, vol. 15, No. 2, 1961, pp. 297-303, printed. British Journal of Nutrition, Cambridge University Press, 32 E. 57th St., New York 22, N. Y.

FISH MEAL:
Low-Fat Fish Meal, Norwegian Patent 96, 116, May 23, 1960. Chemical Abstracts, vol. 55, May 1, 1961 8695f.

FISH MORTALITY:
"Definitive Diagnosis of Fish Mortalities," by E. M. Wood, article, Journal of Water Pollution Control Federation, vol. 32, no. 9, 1960, pp. 994-999, printed. Journal of Water Pollution Control Federation, Prince and Lemon Sts., Lancaster, Pa.

FISH POPULATIONS:
"A Mechanical Model for the Study of Population Dynamics," by Oliver P. Pearson, article, Ecology, vol. 41, no. 3, 1960, pp. 494-508, printed. Ecological Society of America, Duke University Press, Box 6697, College Station, Durham, N. C.

"Suggested Standard Methods of Reporting Fish Population Data for Reservoirs (Prepared for the Reservoir Committee, Southern Division of the American Fisheries Society)," by Eugene W. Surber, article, Proceedings of the Thirteenth Annual Conference. Southeastern Association of Game and Fish Commissioners, pp. 313-325, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1959.

FISH SAUSAGE:
"Studies on the Heat Sterilization of Fish Sausage (1)," by Eiichi Tanikawa, Misao Suwaki and Minoru Akiba, article, Bulletin of Faculty of Fisheries, Hokkaido University, vol. 10, February 1960, pp. 332-356, printed. Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

FISHERY DYNAMICS:
"A Standard Terminology and Notation for Fishery Dynamics," by S. J. Holt and others, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, no. 3, 1959, pp. 245-248, printed. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

FISHERY OCCUPATIONS:
Training Programs for Fishery Occupations, OE-84025, 61 pp., printed, 20 cents. Office of Education, U. S. Department of Health, Education and Welfare, Washington, D. C., 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A booklet containing information on fishery occupational training. Discusses the United States fishing industry; advisory services, national associations, Federal and State agencies; areas of instruction for high schools and short courses; instructional units; and institutions offering courses in fisheries and related sciences.

FISHING WITH LIGHTS:
Improvement of Techniques for Fishing with Lights, by Francois Bourgois and Luigi Farina, General Fisheries Council for the Mediterranean, Studies and Reviews No. 17, 28 pp., illus., processed. GFCM Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy, November 1961.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Describes trials made between 1957 and 1959 by FAO experts for the purpose of determining what technical advances could be introduced into Tunisian fishing practices. Discusses in detail light-fishing methods, fishing lamps, generator sets, findings of detection and control trials, practical implications of detection and control findings, and distribution of gear and dissemination of new techniques. Includes photos of gear and vessels and drawings of equipment used in fishing with lights.

"Primenenitie Svetovykh Blokov pri Love Kilki Rybonasosom" (Use of Bunches of Lamps in Fishing for Sprats with Fish Pumps), by I. V. Nikonorov, article, Rybnoe Khoziaistvo, vol. 35, no. 12, 1959, pp. 42-47, illus., printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

FISHWAYS:

Design of Fishways and Other Fish Facilities, by C. H. Clay, 300 pp., illus., printed, $5. Queens Printer, Ottawa, Canada, 1961.

FLORIDA:

"Exploited Fish Populations of the St. Johns River, Florida," by Harold L. Moody, article, The Quarterly Journal of the Florida Academy of Sciences, vol. 24, no. 1, 1961, pp. 1-18, printed. Quarterly Journal of the Florida Academy of Sciences, University of Florida, Gainsville, Fla.

A Survey of the Number of Anglers and of Their Fishing Effort and Expenditures in the Coastal Recreational Fishery of Florida, by Robert W. Ellis, Albert Rosen, and Alan W. Moffett, Technical Series No. 24, 50 pp., printed. Florida State Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla., 1958.

FLOUNDER:

"Length Shrinkage of Yellowtail Flounder between Live and Landed Condition," by Fred E. Lux, article, Transactions of the American Fisheries Society, vol. 89, no. 4, 1960, pp. 373-374, printed Transactions of the American Fisheries Society, Librarian, Colorado A & M College, Fort Collins, Colo.

FLUKE:

"Age and Growth of the Fluke in Great South Bay and Their Significance to the Sport Fishery," by John C. Poole, article, New York Fish and Game Journal, vol. 8, no. 1, 1961, pp. 1-18, printed. New York Fish and Game Journal, New York Conservation Department, Albany 1, N. Y.

FOOD AND AGRICULTURE ORGANIZATION:

Informe al Gobierno de Chile sobre la Pesca en Aguas Continentales en la Region de los Lagos (Report to the Government of Chile on the Fishery in Inland Waters in the Lakes Region), by Cecil Miles, FAO Fisheries Biology Report No. 28, 87 pp., illus., processed in Spanish, limited distribution. Food and Agriculture Organization of the United Nations, Rome, Italy, September 1961.

Recent Trends in Fisheries, 1960-61, FAO Fisheries Papers, no. 19, October 1961, 10 pp., processed, limited distribution. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. Discusses details of world fish production, fishery products utilization and trade, prices, and fishery policies. Includes statistical tables showing world catch by continent, average 1953-57, 1958 to 1960; and utilization of catches, 1955 to 1960.

Report on FAO-IPFC Training Centre in Fishery Statistics Held at Bombay, India (13th February-30th April, 1959), by V. G. Panse and K. V. R. Sastry, 155 pp., illus., printed. Indian Council of Agricultural Research, New Delhi, India, September 1960.

Some Notes on the Use of the Manatee (TRICHECHUS) for the Control of Aquatic Weeds, FAO Fisheries Biology Technical Paper No. 13, 8 pp., processed, distribution limited. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Rome, Italy, September 1961. Discusses the appearance and occurrence of the manatee or sea cow, its possible use for aquatic weed control, popular articles on the manatee, and drawbacks to transplanting this mammal to a new environment. Concludes that "the introduction of manatees to other parts of the world may eventually prove to be useful, but the present state of our knowledge does not permit any recommendation to this effect."

A World List of Experts Concerned with the Study of Tuna, FAO Fisheries Biology Technical Paper No. 10, 14 pp., processed, distribution limited. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Rome, Italy, February 1961.

FREEZING-CANNING:

"Some Recent Advances in Food Science. Frigi-Canning," by C. J. B. Smit, article, Food Industries of South Africa, vol. 13, no. 8, January 1961, p. 49, printed. Food Industries of South Africa, Odhams Press, South Africa (Pty) Ltd., Trust House, Thibault Square, Cape Town, South Africa Republic.

FREEZE-DRYING:

"Accelerated Freeze Drying. 2--Fundamental Design Problems," by K. Ward, article, Food Manufacture, vol. 36, no. 2, February 1961, pp. 60-63, 66, illus., printed. Food Manufacture, Leonard Hill, Ltd., 9 Eden St., London NW1, England.

Accelerated Freeze-Drying Method of Food Preservation, 173 pp., illus., printed, $2.25. British Information Services, 45 Rockefeller Plaza, New York 20, N. Y., 1961. Discusses in detail how a process was devised whereby a wide variety of food could be freeze-dried, hundreds of pounds at a time, in a period of about eight hours. The product of this method of food preservation, if suitably packaged, can be transported and stored without refrigeration. Section A of the report deals with the engineering angle, including packaging and economics; Section B advises on choice of raw materials, and the preparation, storage, reconstitution, and nutritive value of prepared foods.

"Freeze-Drying of Food Products on a Commercial Scale, article, Modern Refrigeration, vol. 64, no. 756, March 1961, pp. 250-251, illus., printed. Modern Refrigeration, Maclaren House, 131 Great Suffolk St., London SE1, England.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Freeze-Drying Where it Stands in Europe," by John N. Nair, article, Food Engineering, vol. 33, March 1961, pp. 31-34, printed. Food Engineering, Chilton Co., Chestnut and 56th Sts., Philadelphia 39, Pa.

"Lyophilisation of Foodstuffs," by Henaff, article, 5th Symposium on Foreign Matters in Foods, Budapest, May 11-16, 1959, pp. 393-412, illus., printed. Bulletin of the International Institute of Refrigeration, vol. 41, no. 4, 1961. Abstract 9867.

"Point Up Freeze-Dry Phenomena," by John H. Nair, article, Food Engineering, vol. 33, May 1961, pp. 57, 61, printed. Food Engineering, Chilton Co., Chestnut and 56th Sts., Philadelphia 39, Pa.

FREEZING:

"'Direct Conduction' Double Contact Plate Freezers," article, Norwegian Fishing and Maritime News, vol. 8, 1961, pp. 25, 31, printed. Norwegian Fishing and Maritime News, P. O. Box 740, Slottsgt. 3, Bergen, Norway.

"Fish-Handling and Preservation. IV--Practices in Freezing and Frozen Storage," by W. A. Empey, article, Food Preservation Quarterly, vol. 19, no. 1, March 1959, pp. 2-9, printed. Commonwealth Scientific and Industrial Research Organization, Homebush, N. S. W., Australia.

"Heat Transfer When the Fish is Frozen in the Freezer," by J. Nagoaka, article, Refrigeration, vol. 36, no. 402, April 1961, pp. 20-51, illus., printed in Japanese with English summary. Japanese Association of Refrigeration, Kenchiku Kaikan Bldg., 3-1 Ginza Nishi, Chuo-ku, Tokyo, Japan.

Kacestvennye Izmenenija Ryby pri Zamorazivanii (Quality Changes in Fish on Freezing), by A. I. Piskarev, A. K. Kaminarskaja, and L. G. Luk'janica, 40 pp., illus., printed in Russian. V/O Mezhdunarodnaya Kniga, Moscow 200, U.S.S.R.

"Streamlined Quick-Freezing of Fish at Factories in Cape Town," article, Food Industries of South Africa, vol. 13, no. 12, May 1961, pp. 25-31, illus., printed. Food Industries of South Africa, Odhams Press, South Africa (Pty) Ltd., Trust House, Thibault Square, Cape Town, South Africa Republic.

"O Vlijanii Casticnogo Vymorazivanija Vody na Kacestvennoe Sostojanie Ryby i Sroki ee Hranenija"(Effect of Subfreezing on Fish Quality), by N. A. Golovkin and L. I. Persina, article, Kholodil'naia Tehknika, no. 1, 1961, pp. 35-38, printed in Russian. Kholodil'naia Tehknika, c/o Four Continent Book Corp., 822 Broadway, New York 3, N. Y.

FROZEN FISH:

"Preservation of Frozen Fish by Addition of Antioxidants on Glazing," by R. R. Perepletchik and E. I. Novikova. Chemical Abstracts, vol. 54, 17741f, September 10, 1960.

FUR SEALS:

"Fur Seals Breeding in the Falkland Islands Dependencies," by F. A. O'Gorman, article, Nature, vol. 192, no. 4806, December 9, 1961, pp. 914-916, illus., printed. 3s, 6d. (about 45 U.S. cents). Nature, St. Martin's Press, 175 Fifth Ave., New York 10, N. Y. Discusses the fur-seal herds in the Falkland Islands Dependencies, south of South America. Great numbers of fur seals were taken in the Falklands in the early 19th Century and subsequently became nearly extinct. Recent expeditions to this area have shown the existence of several small herds of fur seals, some of which were breeding. The author concludes that "It is hoped that these colonies, especially those in the South Shetlands will be strictly protected in keeping with the resolution on conservation in Antarctica passed by the Special Committee on Antarctic Research of the International Council of Scientific Unions, and allowed to re-inhabit the areas where they were once so numerous and so wantonly destroyed."

GENERAL:

"Fishes of Worldwide (Circumtropical) Distribution," by John C. Briggs, article, Copeia, no. 3, 1960, pp. 171-180, printed. Copeia, American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

Living Fishes of the World, by Earl S. Herald, illus., printed, $9. Doubleday and Company Inc., Garden City, N. Y., 1961.

Transactions of the American Fisheries Society, vol. 90, no. 3, printed, $2.50. Secretary, American Fisheries Society, P. O. Box 483, McLean, Va., 1961. Includes articles on the effects of DDT spraying for budworm on fish in the Yellowstone River system; survival of brook trout in two Michigan trout streams; acute toxicity of some organic insecticides to three species of salmonids; restoration of anadromous alewives at Long Pond, Maine; and some effects of rotenone products on municipal water supplies. Also includes articles on propagation of northern pike; food and distribution of lake whitefish at Lac La Ronge, Saskatchewan; development of a system for controlling dissolved-oxygen content of water; behavior of splake and brook trout fingerlings; lower efficiency in deflecting downstream migrant steelhead; and gillnet selectivity of lake whitefish from Goderich-Bayfield area, Lake Huron.

GERMAN FEDERAL REPUBLIC:

Jahresbericht uber die Deutsche Fischwirtschaft, 1960/61 (Annual Report on German Fisheries, 1960/61), issued by the Ministry of Food, Agriculture, and Forestry in cooperation with the Federal Statistical Office, 304 pp., illus., printed in German with English table of contents and summaries. DM 25 (about US$6.25). (Available from Gebr. Mann, Berlin-Schoeneberg, Hauptstrasse 26, Germany, 1961.) A review covering all phases of the German fisheries in 1960/61. Part I contains information on fishery policy, legislation, the sea and coastal fisheries as well as the fish supply in the Federal Republic of Germany, organization of the fishing industry, the fishing fleet, biological-statistical report on the German deep-sea fishery, foreign trade in fishery products, interzonal trade, and imports of fishery products in Common Market countries. Part II includes information on cruises of the fishery protection and fishery research vessels, the fishing industry and the Seamen's Vocational Association, work of the German Scientific Commission for the Exploration of the Sea, and fishery research. Part

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

III presents data on the German deep-sea fishery in 1960, the lugger herring fishery, the cutter deep-sea and coastal fisheries, fresh-water fisheries, processing of fish and shellfish, propaganda campaign, and promotional activities. Part IV gives data on foreign fisheries and whaling.

GERMANY:
Berichte der Deutschen Wissenschaftlichen Kommission fur Meeresforschung (Proceedings of the Scientific Commission for Sea Fisheries Research), Neue Folge, Band XVI, Heft 2, 1961, 160 pp., illus., printed in German with English summaries. Berichte der Deutschen Wissenschaftlichen Kommission fur Meeresforschung, E. Schweizerbart'sche Verlagsbuchhandlung (Nagele u. Obermiller), Stuttgart W., Germany.

GILL-NETTING:
"Nekotorye Voprosy Teorii Lova Ryby Zhabernymi Setiami" (Certain Problems of the Theory of Fishing with Gillnets), by N. N. Andreev, article, Trudy VNIRO, vol. 30, 1955, pp. 109-127, illus., printed in Russian. VNIRO, Pishchepromizdat, Moscow, U.S.S.R.

HALIBUT:
Regulation and Investigation of the Pacific Halibut Fishery in 1960, Report of the International Pacific Halibut Commission No. 30, 24 pp., illus., printed. International Pacific Halibut Commission, University of Washington, Fisheries Hall #2, Seattle 5, Wash., 1961. A brief report of the accomplishments of the Commission during 1960 covering its historical background, activities during the year, 1960 regulations, statistics of the fishery, landings by ports, and modification of fishing seasons. Also covers catch per unit of fishing effort, composition of the catches, growth studies, tagging experiments, and studies of halibut below commercial size.

HERRING:
"Estimation of the Stock Strength of the Norwegian Herring," by O. Aasen, article, Journal du Conseil Permanent International pour l'Exploration de la Mer, vol. 24, no. 1, 1958, pp. 95-110, printed. Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark.

"Herring Movements in the Bay of Fundy and Gulf of Maine, 1957 and 1958," by R. A. McKenzie and S. N. Tibbo, article, Journal of Fisheries Research Board of Canada, vol. 18, no. 2, 1961, pp. 221-252, printed. Queen's Printer & Controller of Stationery, Ottawa, Canada.

International North Pacific Fisheries Commission, Bulletin No. 4 (The Exploitation, Scientific Investigation and Management of Herring (Clupea pallasi) on the Pacific Coast of North America in Relation to the Abstention Provisions of the North Pacific Fisheries Convention), 106 pp., illus., printed. International North Pacific Fisheries Commission, 6640 Northwest Marine Dr., Vancouver 8, B. C., Canada, August 1961. Presents a series of papers submitted to the Commission over a period of approximately four years by the Governments of Canada, Japan, and the United States. Their purpose was to provide information which would aid the Commission to make a determination as to whether these herring stocks continued to qualify for abstention from fishing by Japan, under the provisions of the International Convention for the High Seas Fisheries of the North Pacific Ocean. The Governments of Canada, Japan, and the United States accepted the Commission's recommendation, and on May 24, 1960, herring off the coast of Alaska were removed from the list of stocks under abstention. Continued under abstention were herring of British Columbia and stocks of herring along the coast of the United States south of the entrance to the Strait of Juan de Fuca.

"Swimming Speed of Immature Atlantic Herring with Reference to the Passamaquoddy Tidal Project," by H. C. Boyar, article, Transactions of the American Fisheries Society, vol. 90, no. 1, 1961, pp. 21-26, printed. Transactions of the American Fisheries Society, Librarian, Colorado A & M College, Fort Collins, Colo.

HORSE MACKEREL:
"Biochemical Studies on Lipides of Horse Mackerel (Trachurus japonicus)," by Hideo Tsuyuki, Uhei Naruse, and Akio Shionoya. Chemical Abstracts, vol. 55, 9911e, May 15, 1961.

INDIANS:
"Fishing . . . Indian Way," by Don Neal, article, Pennsylvania Angler, vol. 30, no. 12, December 1961, pp. 3-5, illus., printed, 25 cents. Pennsylvania Fish Commission, South Office Bldg., Harrisburg, Pa. Discusses the selection of a site for a village which was advantageous for fishing, construction of a net, ceremonies and activities of the fish kill, preparation of the fish, and the last recorded fish kill in Pennsylvania before World War I.

INTERNATIONAL COMMISSIONS:
International North Pacific Fisheries Commission, Bulletin No. 5, 58 pp., illus., printed. International North Pacific Fisheries Commission, 6640 Northwest Marine Dr., Vancouver 8, B. C., Canada. August 1961. Includes these articles: "Observations of Molting Female King Crabs, Paralithodes camtschatica (Tilesius)," by Henry M. Sakuda; "Stomach Contents of the Bering Sea King Crab," by Patsy A. McLaughlin and James F. Hebard; "Currents in Southeastern Bering Sea," by James F. Hebard; "Method Used to Distinguish Between Immature and Maturing Sockeye and Chum Salmon Taken by Canadian Exploratory Fishing Vessels in the Gulf of Alaska," by Harold Godfrey; "Criteria for the Differentiation of Mature and Immature Forms of Chum and Sockeye Salmon in Northern Seas," by Rikiichi Ishida, Kenji Takagi, and Setsuko Arita; and "Blood Types in Pacific Salmon," by George J. Ridgway and George W. Klontz.

IRRADIATED FOODS:
"Evaluation of the Palatability of Irradiated Foodstuffs," by H. R. Kraybill, article, Irradiation des Aliments, vol. 1, no. 2, October-December 1960, pp. A2-A3, printed in French. Bulletin of the International Institute of Refrigeration, vol. 41, no. 4, 1961, Abstract 9898.

"Note on the Palatability of Irradiated Food," by B. Connor Johnson, article, Irradiation des Aliments, vol. 1, no. 2, October-December 1960, pp. A4-A5. Bulletin of the International Institute of Refrigeration, vol. 41, no. 4, 1961, Abstract 9899.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

IRRADIATION:

"Preservation of Fish and Shellfish by Relatively Low Doses of Beta Radiation and Antibiotics," by Peter A. Lerke, Lionel Farber and Wolfgang Huber, article, Food Technology, vol. 15, March 1961, pp. 145-152, printed. Food Technology, The Garrard Press, 510 North Hickory St., Champaign, Ill.

"Progress is Being Made in Food Radiation," by Ferdinand P. Mehrlich, article, Food Processing, vol. 22, May 1961, pp. 40-43, printed. Food Processing, Putman Publishing Co., 111 East Delaware Place, Chicago, Ill.

Strahlenkonservierung und Kontamination von Lebensmitteln (Irradiation Storage and Contamination of Foodstuffs), by J. Kuprianoff and K. Lang, 297 pp., illus., printed in German, DM 64 (about US$16). Verlag Dr. Dietrich Steinkopff, Holzhofallee 35, Darmstadt, Germany.

ISRAEL:

Fishermen's Bulletin, vol. 3, no. 9 (29), September 1961, 32 pp., illus., printed in Hebrew with some English abstracts. Fishermen's Bulletin, Sea Fisheries Research Station, P. O. Box 699, Haifa, Israel. Includes, among others, these articles: "Observations on the Reaction of Fishes to Artificial Light (II)," by A. Ben-Tuvia; "Trawl Fisheries in the North Atlantic (II)," by M. Kramer; "The Maiden Voyage of the Fishing Vessel Daguite (I)," by Z. Fried; "Fishing Harbours in Israel," by J. Tauman; "The Layout of F/V Daguite," by J. Bejerano; and "'Dalyan' a Turkish Trap-Net and Its Possible Use in Eilat," by S. Levin.

KENYA:

Report on Kenya Fisheries, 1960, 28 pp., printed, 3 s. (about 42 U. S. cents). Government Printer, Nairobi, Kenya, 1961. Reviews the work done in inland fisheries development, Lake Victoria fisheries, a fish culture farm, and a trout hatchery and fisheries. The section on sea fisheries covers fresh, chilled, and frozen fish; imports of fishery products; the dried fish industry; the dried shark fishery; crawfish; green turtles; shellfisheries; and game fishing. Fishing investigations and gear development are discussed and several tables on imports, exports, and catch are included.

KOREA:

Outline of Development and Research Activities in Korean Fisheries, by Lee Bong Nai, 40 pp., processed, Central Fisheries Experiment Station, Ministry of Agriculture and Forestry, Republic of Korea, Pusan, Korea. Discusses the general characteristics of Korean fisheries: fishing boats; fishing methods, size of boat, and fishing time; fishing ports; and landings of fish and shellfish and utilization. Also covers development and research activities: exploratory fishing and fishing gear development; processing and food technology development; aquiculture and marine research.

LAKE TROUT:

"The Lake Trout of Lac La Ronge, Saskatchewan" by D. S. Rawson, article, Journal of the Fisheries Research Board of Canada, vol. 18, no. 3, 1961, pp. 423-462, printed. Queen's Printer & Controller of Stationery, Ottawa, Canada.

LAKE VICTORIA:

"A Revision of the Lake Victoria Haplochromis Species (Pisces, Cichlidae) Part IV" by P. H. Greenwood, article, Bulletin of the British Museum (Natural History), Zoology, vol. 6, no. 4, 1960, pp. 229-281, printed. The British Museum (Natural History), Zoology, Cromwell Rd., London SW1, England.

LAMPREYS:

"Incidence of Lamprey Scarring on Fish in the Upper Mississippi River, 1956-58," by Raymond C. Hubley, Jr., article, Transactions of the American Fisheries Society, vol. 90, no. 1, 1961, pp. 83-85, printed Transactions of the American Fisheries Society, Librarian, Colorado A & M College, Fort Collins, Colo.

LIGHT:

"Possible Effect of Lethal Visible Light on Year-Class Fluctuations of Aquatic Animals," by Alfred Perlmutter, article, Science, vol. 133, no. 3458, 1951, pp. 1081-1082, printed. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW, Washington 5, D. C.

LOUISIANA:

Compilation of Louisiana Laws Pertaining to Wild Life and Fisheries, 1958 (Louisiana Revised Statutes of 1950 Including Acts of 1950 Regular Session of the Legislature, as Amended), 215 pp.; 1960 Supplement (Containing the Acts of 1960 of the Regular Session of the Legislature and a Digest and Summary of the Acts of 1960), 79 pp., printed. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La.

MACKEREL:

Lecture Notes Prepared for the International Training Centre on the Methodology and Techniques of Research on Mackerel (RASTRELLIGER) (Bangkok, Thailand, 20 October-28 November 1958), 125 pp., illus., processed. Food and Agriculture Organization of the United Nations, Rome, Italy, February 1959.

MANATEES:

"The Manatee: Ecology and Use for Weed Control," by W. H. L. Allsopp, article, Nature, vol. 188, no. 4752, 1960, p. 762, printed. Nature, St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

"The Manatee in the Lesser Antilles," by C. E. Ray, article, Journal of Mammalogy, vol. 41, no. 3, 1960, pp. 412-413, printed. American Society of Mammalogists, 1041 New Hampshire St., Lawrence, Kans.

MARINE BIOLOGY:

Marine Biology. Transactions of the Institute of Oceanology, vol. 20, edited by B. N. Nikitin, 302 pp., printed, $10. American Institute of Biological Sciences, 2000 P St. NW., Washington 6, D. C.

MARINE FISH:

"Mortality of Marine Fishes Following Tropical Rainstorms," by Ivan Goodbody, article, Association of Island Marine Laboratories, 2nd Meeting, 1958, p. 17, printed. Association of Island Marine Laboratories,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Bermuda Biological Station, Bermuda, British West Indies.

MARINE PLANTS:
"Plantas Marinas de la Zona de las Mareas de El Salvador" (Intertidal Marine Plants of El Salvador), by E. Yale Dawson, article, Pacific Naturalist, vol. 2, no. 8, July 31, 1961, pp. 389-461, illus., printed in Spanish and English. Beaudette Foundation for Biological Research, Box 482, R. F. D. 1, Solvang, Calif.

MARYLAND:
Final Report--Maryland Commission on Research and Education, 1941-1961, 21 pp., printed. Department of Research and Education, Annapolis, Md., May 31, 1961. Summarizes the functions of the Maryland Commission of Research and Education during the period 1941-1961, in anticipation of its transfer to the University of Maryland as the newly created Natural Resources Institute. Discusses the history of fisheries research in Maryland; work of the various divisions; research conducted on oysters, clams, crabs, fish, plankton, and inland resources; contract activities; and regulatory activities. Also includes a list of publications of the Chesapeake Biological Laboratory and Maryland Department of Research and Education.

Record Maryland Fish (Salt and Brackish Species), by Frank Schwartz, Educational Series No. 49, 6 pp., printed. (Reprinted from Maryland Conservationist, vol. 38, no. 3, May-June 1961.) Department of Game and Inland Fish, State Office Bldg., Annapolis, Md.

Record Maryland Fish (These are the Champs), by Harold J. Elser, Educational Series No. 51, 3 pp., printed. (Reprinted from Maryland Conservationist, vol. 38, no. 2, March-April 1961.) Department of Game and Inland Fish, State Office Bldg., Annapolis, Md.

MIDDLE ATLANTIC:
Fishes of Chincoteague and Sinepuxent Bays, by Frank J. Schwartz, 25 pp., illus., printed. (Reprinted from The American Midland Naturalist, vol. 65, no. 2, April 1961, pp. 384-408.) The American Midland Naturalist, University of Notre Dame Press, Notre Dame, Ind. A comprehensive monthly trawl survey of Maryland and Virginia's Sinepuxent and Chincoteague Bays found 65 species of fish within 40 families and 59 genera currently occupying those two seaside bays. Twenty-three species were new to the fauna which, since 1876, now totals 99 species. Various methods, beach seining, crab potting, hook and line fishing, and wire oyster test trays, were employed to capture smaller species.

MORTALITIES:
"Definitive Diagnosis of Fish Mortalities," by E. M. Wood, article, Journal of the Water Pollution Control Federation, vol. 32, 1960, pp. 994-999, printed. Journal of the Water Pollution Control Federation, Prince and Lemon Sts., Lancaster, Pa.

NETS:
"Choice and Use of Synthetic Fibers for Fresh Water Fishery," by G. Klust, article, Fischwirt, vol. 9, 1959, pp. 221-234, printed in German. Deutscher Fischerei-Verband, Neuerwall 72, Hamburg 36, Germany.

"Measures for Preventing Damages to Driftnets," by N. K. Piaterikin, article, Rybnoe Khoziaistvo, vol. 34, 1958, pp. 30-38, printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

"The Use of Hobbled Gill Nets in a Commercial Fishery of Lake Carl Blackwell, Oklahoma," by William R. Heard, article, Proceedings of the Thirteenth Annual Conference. Southeastern Association of Game and Fish Commissioners, pp. 90-95, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1959.

NORWAY:
Norges Fiskerier, 1959 (Fishery Statistics of Norway, 1959), Norges Offisielle Statistikk XII 60, 94 pp., illus., printed in Norwegian with English summary. Fiskeridirektoren, Bergen, Norway, 1961. Contains data on the number of Norwegian fishermen, vessels, processing plants, and gear; quantity and value of total landings; various types of herring; sprat; cod; mackerel; tuna; dogfish; capelin; deep-water shrimp; distant-water fisheries; groundfish trawling; catch of small whales and seals. Also includes statistical tables showing quantity and value of sea fisheries, 1910-1960; production of some fishery products, 1956-1959; winter herring landings; exports and imports of fishery products, 1957-1959; landings of principal species of fish, by months; and related data.

NUTRITION:
"Nutritive Value of Fish. II--Biotin, Folic Acid, Pantothenic Acid, and Free Amino Acids of Various Salt-Water Species," by M. E. Loughlin and A. E. Terri, article, Food Research, vol. 25, 1960, pp. 479-483, printed. Institute of Food Technologists, 510/22 N. Hickory St., Champaign, Ill.

NUTRITIVE VALUE:
"Nutritive Value of Fresh Fish, Canned Fish, and Fish Meal," by Werner G. Jaffe. Chemical Abstracts, vol. 55, 6719h, April 3, 1961.

OCEANOGRAPHY:
"The International Indian Ocean Expedition," by John A. Knauss, article, Science, vol. 134, no. 3491, November 24, 1961, pp. 1674-1676, printed, single copy 35 cents. Science, American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington 5, D. C. The author states that a concerted effort will be made by scientists to learn as much as possible about the Indian Ocean in the next few years. At least 20 ships from a dozen countries will participate. The work will consist of the probable establishment of a marine taxonomic center somewhere in India; the operation of a laboratory ship for 2 years in the Indian Ocean for the purpose of studying marine biological problems; a series of geological and geophysical reconnaissance surveys of parts of the Indian Ocean; and an increase in the network of upper-air meteorological stations for studying the monsoon circulation. United States participation will include projects by the Woods Hole Oceanographic Institution, the U. S. Coast and Geodetic Survey, the Scripps Institution of Oceanography of the University of California, the Narrangansett

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Marine Laboratory of the University of Rhode Island, and the National Institute of Oceanography.

"Probable Effects of Proposed Passamaquoddy Power Project on Oceanographic Conditions," by R. W. Trites, article, Journal of the Fisheries Research Board of Canada, vol. 18, no. 2, 1961, pp. 163-201, printed. Queen's Printer & Controller of Stationery, Ottawa, Canada.

"Use of Drift Bottles in Fisheries Research," by D. Vaux and A. M. Olsen, article, Fisheries Newsletter, vol. 20, no. 1, 1961, pp. 17-20, printed. Commonwealth Fisheries Office, Department of Primary Industry, Canberra, Australia.

OYSTERS:

"The Chemical Composition of the Gastric Shield of the Oyster Crassostrea virginica (Gmelin)," by Barbara L. Shaw and Helen I. Battle, article, Canadian Journal of Zoology, vol. 37, 1959, printed. Division of Administration, National Research Council, Sussex St., Ottawa 2, Canada.

OYSTER TOADFISH:

A Bibliography of Papers Dealing with the Oyster Toadfish, OPSANUS TAU, by Paul F. Robinson, Contribution No. 183, 9 pp., processed. Natural Resources Institute, Chesapeake Biological Laboratory, Solomons, Md.

PACKAGING:

"New Flexibility for Fish-Stick Packaging," article, Food Processing, vol. 22, July 1961, p. 74, printed. Food Processing, Putman Publishing Co., 111 East Delaware Place, Chicago 2, Ill.

PERCH:

Ecology and Territorial Behaviour of the Script Perch (SERRANUS SCRIBA Cuv.), by Rosl Kirchshofer, Translation Series No. 341, 17 pp., processed. (Translated from German, Osterreichische Zoologische Zeitschrift, vol. 5, 1954, pp. 329-349.) Fisheries Research Board of Canada, Biological Station, St. Andrews, N. B., Canada, 1961.

PESTICIDES:

"Effects of Pesticides on Commercial Fisheries," by Philip A. Butler, article, Proceedings of the Gulf and Caribbean Fisheries Institute, vol. 13, 1960, pp. 168-172, printed. Gulf and Caribbean Fisheries Institute, The Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami 49, Fla.

PLANKTON:

Phytoplankton of Chesapeake Bay (An Illustrated Guide to the Genera), by Ruth E. Griffith, Contribution No. 172, 82 pp., illus., printed. Chesapeake Biological Laboratory, Maryland Department of Research and Education, Solomons, Md., May 1961.

POLLUTION:

Pollution-Caused Fish Kills, January-September 1961, 7 pp., processed. Public Health Service, U. S. Department of Health, Education, and Welfare, Washington 25, D. C., November 1961.

"Pollution and the Fisheries," by A. L. Pritchard, article, Papers of the First Ontario Industrial Waste Conference, 1954, pp. 115-119, printed. Ontario Industrial Waste Conference, Toronto, Ontario, Canada.

"Pollution of Streams and Fisheries," by Schweng, Water Pollution Abstracts, vol. 33, no. 9, 1960, Abst. No. 1686.

"The Problem of the Permissible Pollution Load on Flowing Waters," by F. Wachek, article, Zeitschrift fur Fischerei und deren Hilfswissenschaften, vol. 8, no. 1/3, 1959, pp. 87-104, printed in German. Zeitschrift fur Fischerei und deren Hilfswissenschaften, Neumann Verlag, 19 Dr. Schmincke Allee, Radebeul 1, Germany.

PRESERVATION:

"Preparation of a Coating Material by Chlorination of Fish. VII--Preparation of a Chlorination Product with High Melting Point," by Kosaku Suzuki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, May 1960, pp. 508-513, printed. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

PURSE SEINING:

"O Kompleksnoi Mekhanizatsii Koshel'kovogo Lova" (On Complex Mechanization of Purse Seining), by A. A. Romanov, article, Rybnoe Khoziaistvo, vol. 35, no. 1, 1959, pp. 42-49, illus., printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

QUALITY:

"Effect of Subfreezing on the Quality and Storage Life of Fish," by N. A. Golovkin and L. I. Pershina, article, Annex 1960-3 to Bulletin I. I. R., pp. 289-296, illus., printed in French and English. Institute International du Froid, 177 Boulevard Malesherbes, Paris XVII, France.

"Some Factors Affecting the Loss of Quality of Frozen Fish in Distribution," by D. L. Nicol and R. Spencer, article, Annex 1960-3 to Bulletin I. I. R., pp. 303-307, illus., printed in French and English. Institut International du Froid, 177 Boulevard Malesherbes, Paris XVII, France.

SALMON:

"The Appearance of Pink Salmon, Oncorhynchus gorbuscha (Walbaum), in Lake Superior," by Robert E. Schumacher and Samuel Eddy, article, Transactions of the American Fisheries Society, vol. 89, no. 4, 1960, pp. 371-373, printed. Transactions of the American Fisheries Society, Librarian, Colorado A & M College, Fort Collins, Colo.

"On the Chinook Salmon Eggs, Oncorhynchus tschawytscha (Walbaum), First Planted in Hokkaido, Japan," by Toyohiko Hikita, article, Scientific Reports of the Hokkaido Salmon Hatchery, no. 15, 1960, pp. 1-6, printed. Hokkaido Salmon Hatchery, Fisheries Agency, Nakanoshima, Outskirt of Sapporo, Hokkaido, Japan.

"Contribution to the Comparative Physiology and Genetics of the European Salmonidae. III--Temperature Resistance at Different Ages," by J. T. Spaas, article, Hydrobiologia, vol. 15, nos. 1/2, 1960, pp. 78-88, printed. Hydrobiologia, Uitgeverij Dr. W. Junk, The Hague, Netherlands.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"The Development of Salinity Tolerance in the Salmon, Salmo salar (L.) and Some Related Species," by Gwyneth Parry, article, Journal of Experimental Biology, vol. 37, no. 2, 1960, pp. 425-434, printed. Journal of Experimental Biology, Cambridge University Press, 200 Euston Rd., London NW1, England.

"Influence of Size upon the Adaptation of Steelhead Trout, Salmo gairdneri, and Chum Salmon, Oncorhynchus keta to Sea Water," by Arthur H. Houston, article, Journal of the Fisheries Research Board of Canada, vol. 18, no. 3, 1961, pp. 401-415, printed. Queen's Printer & Controller of Stationery, Ottawa, Canada.

"Methods of Enumerating Salmon in Alaska," by Richard R. Straty, article, Transactions of the Twenty-Fifth North American Wildlife and Natural Resources Conference, 1960, pp. 286-297, printed. Wildlife Management Institute, Wire Bldg., Washington 5, D. C.

"Mortalities of Downstream Migrant Salmon at McNary Dam," by Dale E. Schoeneman, article, Transactions of the American Fisheries Society, vol. 90, no. 1, 1961, pp. 58-72, printed. Transactions of the American Fisheries Society, Librarian, Colorado A & M College, Fort Collins, Colo.

Progress Report to Pacific Northwest Power Company on the Development of Facilities for Passing Migrant Fish over High Dams, by Eldon R. Floodeen, 17 pp., illus., processed.

Racial Identification of Fraser River Sockeye Salmon by Means of Scales and Its Applications to Salmon Management, by Kenneth A. Henry, Bulletin XII, 100 pp., illus., printed. International Pacific Salmon Fisheries Commission, New Westminster, B. C., Canada, 1961.

"Results from Marking Experiments on Young Chum Salmon in Hokkaido, 1951-1959," by Ei-ichi Sakano, article, Scientific Reports of the Hokkaido Salmon Hatchery, no. 15, 1960, pp. 17-38, printed. Hokkaido Salmon Hatchery, Fisheries Agency, Nakanoshima, Outskirt of Sapporo, Hokkaido, Japan.

"Salmon Canning--A Thriving Industry of the Canadian North West," by Elliot B. Dewberry, article Food Manufacture, vol. 36, May 1961, pp. 185-191, printed. Food Manufacture, Leonard Hill, Ltd., Stratford House, 9 Eden St., London NW1, England.

"Selective Breeding of Chinook Salmon," by Lauren R. Donaldson and Deb Menasveta, article, Transactions of the American Fisheries Society, vol. 90, no. 2, 1961, pp. 160-164, printed. Librarian, Colorado A & M College, Fort Collins, Colo.

"Studies on the Kokanee Salmon. III--Fluctuations in Abundance of the Spawning Kokanee Salmon of Lake Shikotsu, Hokkaido, Japan," by Toshinobu Tokui, article, Scientific Reports of the Hokkaido Salmon Hatchery, no. 15, 1960, pp. 7-16, printed. Hokkaido Salmon Hatchery, Fisheries Agency, Nakanoshima, Outskirt of Sapporo, Hokkaido, Japan.

"Temperature Relationships in a Pink Salmon Stream in Alaska," by William L. Sheridan, article, Ecology, vol. 42, no. 1, 1961, pp. 91-98, printed. Ecological Society of America, Duke University Press, Box 6697, College Station, Durham, N. C.

SAURY:

"Lipides of Pacific Saury. I--Solvent Fractionation of Lipide of Pacific Saury," by Katsuo Nagakura and Noriko Kawasaki. Chemical Abstracts, vol. 55, 8690g, May 1, 1961.

SEA LAMPREY:

Distribution of Sea Lamprey Ammocoetes in Lake Michigan Tributaries of the Upper Peninsula of Michigan, 1955-1959, by Thomas M. Stauffer, Miscellaneous Publication No. 14, 19 pp., illus., printed. Michigan Department of Conservation, Institute for Fisheries Research, Ann Arbor, Mich., January 1961.

SEAWEED:

"More Food From Seaweed," article, Food Manufacture, vol. 36, June 1961, p. 225, printed. Food Manufacture, Leonard Hill, Ltd., Stratford House, 9 Eden St., London NW1, England.

SEROLOGY:

"Serological Criteria of Species," by F. J. O'Rourke, article, Irish Journal of Medical Science, no. 410, 1960, pp. 76-80, printed. Royal Academy of Medicine in Ireland, Cahill and Co., Ltd., Parkgate Printing Works, Dublin, Ireland.

SHAD:

"Natural Mortality of American Shad," by Charles H. Walburg, article, Transactions of the American Fisheries Society, vol. 90, no. 2, 1961, pp. 228-230, printed. Librarian, Colorado A & M College, Fort Collins, Colo.

SHARKS:

"Experimental Shark Pens at the Lerner Marine Laboratory," by Perry W. Gilbert and Henry Kritzler, article, Science, vol. 132, no. 3424, 1960, p. 424, printed. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW, Washington 5, D. C.

"The Investigation of Salmon Shark as a Predator on Salmon in the North Pacific," by Osamu Sano, article, Bulletin of the Hokkaido Regional Fisheries Research Laboratory, no. 22, September 1960, pp. 68-82, printed. Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan.

"A New Species of Sawshark, Pristiophorus schroederi, from the Bahamas," by Stewart Springer and Harvey R. Bullis, Jr., article, Bulletin of Marine Science of the Gulf and Caribbean, vol. 10, no. 2, 1960, pp. 241-254, printed. Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami 49, Fla.

"Notes on Western North Atlantic Sharks," by Richard H. Backus, article, Copeia, no. 3, 1960, pp. 243-245, printed. Copeia, American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Observations on Sharks during Oceanographic Cruises," by Paul W. Hess, article, Estuarine Bulletin, vol. 6, nos. 3 and 4, December 1961, pp. 6-11, illus., printed. Estuarine Bulletin, University of Delaware, Department of Biological Sciences, Newark, Del. Discusses recent interest in sharks, evolution and occurrence of the shark, species observed during cruises, food-searching activity, an unprovoked shark attack, physical characteristics, reproduction, and distinguishing features.

SHELLFISH:
"Collaborative Studies of the Chemical Assay for Paralytic Shellfish Poison," by Earl F. McFarren and J. E. Campbell, article, Journal of the Association of Official Agricultural Chemists, vol. 44, May 1961, pp. 278-281, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C.

"Public Health Significance of Paralytic Shellfish Poison," by Earl F. McFarren and others. Chemical Abstracts, vol. 55, 9705a, May 15, 1961.

"Shellfish Poisoning--Another North American Ghost," by J. D. Medcof, article, The Canadian Medical Association Journal, vol. 82, January 9, 1960, pp. 87-90, printed. Canadian Medical Association, 105 St. George St., Toronto 5, Canada.

SHRIMP:
"The Bait Shrimp Fishery of Galveston Bay, Texas," by Edward Chin, article, Transactions of the American Fisheries Society, vol. 89, no. 2, 1960, pp. 135-141, printed. The American Fisheries Society, P. O. Box 429, McLean, Va.

SMELT:
"The Smelt Fishery of the Miramichi, 1960-61," by R. A. McKenzie, article, Trade News, vol. 14, nos. 5-6, November-December 1961, pp. 13-16, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Discusses smelt landings in the Miramichi River in recent years, the spring spawning runs, the Great Lakes smelt fishery, and a survey of smelt spawning conducted in 1961. Includes statistical tables showing smelt landings, 1946-1961.

SMOKED FISH:
"Phenolic Content of Smoked Fish," by A. I. Yuditskaya and T. M. Lebedeva. Chemical Abstracts, vol. 55, 11696a, June 12, 1961.

SOLE:
"The Stock of Soles (Solea solea) and the Sole Fishery on the Danish North Sea Coast," by Jorgen Moller Christensen, article, Meddelelser Fra Danmarks Fiskeri -og Havundersogelser, vol. 3, nos. 1-6, 1960-1961, pp. 19-63, printed in Danish. Fiskeriministeriets Forsoglaboratorium, 10 Oster Voldgade, Copenhagen, Denmark.

SOUTH AFRICA REPUBLIC:
Department of Nature Conservation, Report No. 17, 1960, 104 pp., illus., printed. Department of Nature Conservation, Provincial Administration of the Cape of Good Hope, Cape Town, Republic of South Africa. This report covers the activities of the Department of Nature Conservation for 1960. It includes, among others, a section on the Division of Inland Fisheries which discusses the two Government hatcheries, stocking of public waters, tidal waters of the Cape, new type of pond for rearing trout, survey of dams in the northern Cape, comparison of the growth rate of 6 species of fish, and sale of angling licenses.

SOUTH-WEST AFRICA:
Shell in Industry (Special South West Africa Issue), no. 39, July/September 1961, 32 pp., illus., printed. Shell South Africa (Pty.) Ltd., P. O. Box 2231, Cape Town, South Africa Republic. Contains, among others, the following articles: "Four Million Pilchards a Day;" "Big Money in Guano;" and "Walvis Bay--Industrial Mushroom."

SPAIN:
"Comercio Exterior Pesquero en 1960" (Foreign Trade in Fishery Products in 1960), article, Boletin de Informacion, no. 37, October 1961, pp. 9-12, printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, Madrid, Spain.

SPOT:
"Age and Growth of the Spot, Leiostomus xanthurus Lacepede," by Bangalore I. Sundararaj, article, Tulane Studies in Zoology, vol. 8, no. 2, October 28, 1960, pp. 41-62, illus., printed, 65 cents. Meade Natural History Library, c/o Department of Zoology, Tulane University, New Orleans 18, La.

STANDARDS:
"Biochemische Untersuchungen zur Frage der Aufstellung von Guteklassen bei Seefischen" (Biochemical Investigations into the Problem of Establishing Quality Standards for Seafishes), by F. Bramstedt and J. Wurzbacher, article, Fette-Seifen-Anstrichmittel, vol. 62, no. 6, 1960, pp. 513-517, printed in German. Fette-Seifen-Anstrichmittel, Industrieverlag von Hernhaussen K. G., Hamburg 11, Germany.

What Consumers Should Know About Food Standards, Food and Drug Administration Publication No. 8, 12 pp. illus., printed, 15 cents. Food and Drug Administration, U. S. Department of Health, Education, and Welfare, Washington, D. C., 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses standards of identity and quality, etc. for foods and how the consumer depends on such standards; and how the Food and Drug Administration collects market samples in a ceaseless watch for products that are below standard. The booklet is illustrated with photographs showing some of the scientific tests FDA makes to check samples of food products against the standards.

STATISTICS:
"Use of Machine Methods in Processing Fishery Data," by Victor W. Lambou, article, Proceedings of the Thirteenth Annual Conference, Southeastern Association of Game and Fish Commissioners, pp. 116-120, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1959.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

STORAGE:

"British Study Effect of Various Factors on Storage of AFD Cod Steaks," article, Food Engineering, vol. 33, June 1961, p. 91, printed. Food Engineering, Chilton Co., Chestnut and 56th Sts., Philadelphia 39, Pa.

"Frozen Fish Storage," by W. J. Dyer, article, Annual Review and Program for the 14th Annual Meeting of the Fisheries Council of Canada, pp. 33, 35, printed. Fisheries Council of Canada, P. O. Box 547, Ottawa, Canada, 1959.

"The Storage of Sea-Products with Antibiotics and Irradiation," by P. Vidal, article, Revue Generale du Froid, vol. 38, no. 1, January 1961, pp. 14-16, printed in French. Association Nationale des Ingenieurs et Techniciens du Froid et des Industries Connexes, 129 Boulevard St. Germain, Paris VI, France.

STRIPED BASS:

Atlantic Coast Migration of Large Striped Bass as Evidenced by Fisheries and Tagging, by Robert B. Chapoton and James E. Sykes, 8 pp., illus., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 90, no. 1, January 1961, pp. 13-20.) Transactions of the American Fisheries Society, Librarian, Colorado A & M College, Fort Collins, Colo. During studies of Atlantic Coast striped bass, Roccus saxatilis (Walbaum), by the U. S. Fish and Wildlife Service and cooperators from 1955 to 1959, 478 large fish ranging in weight from 6 to 54 pounds and in age from 3 to 18 years were tagged. Tagging locations were the North Carolina coast where 81 fish were tagged; Albemarle Sound and Roanoke River (N. C.) where 97 fish were tagged; and Chesapeake Bay and tributaries where 300 tags were applied. Catches by commercial and sport fisheries indicated that large striped bass concentrated on the coast of North Carolina in late fall and winter, on or near spawning areas for striped bass in North Carolina and Chesapeake Bay in late winter and spring, and along the coast north of Chesapeake Bay as far as Massachusetts in the summer and fall.

SWEDEN:

Organizational Work Amongst Swedish West Coast Fishermen, by Georg Aberg, 7 pp., printed. Handelstryckeriet, Goteborg, Sweden, 1959. Discusses how fishermen are organized, work of the Swedish West Coast Fishermen's Central Organization, cooperative fish marketing, price controls, and cooperative salting. Also covers fish processing, economic activities of the Organization, collaboration with other fishermen's organizations, cultural and publicity work, organizing study activities, and the future of the Organization.

TAGGING:

"An Electric Instrument for Brandmarking Fish," by Rom. Moav, article, Bamidgeh, vol. 12, no. 4, 1960, pp. 92-95, printed. Department of Fisheries and Fish Breeders' Association, Nir-David, D. N., Hakirya, Israel.

"Radioactive Iron as a Fish Mark," by D. P. Scott, article, Journal of the Fisheries Research Board of Canada, vol. 18, no. 3, 1961, pp. 383-391, printed. Queen's Printer & Controller of Stationery, Ottawa, Can.

TARIFFS:

Tariff Classification Study, First Supplemental Report, (Report to the President and to the Chairmen of the Committee on Ways and Means of the House and the Committee on Finance of the Senate Pursuant to Title I of the Customs Simplification Act of 1954), 1,113 pp., illus., processed, $6. United States Tariff Commission, Washington, D. C., January 1962. Embodies the changes in the headnotes and tariff schedules of the Tariff Classification Study, published November 15, 1960, which, in the judgment of the Commission, are necessary to bring them down to date, to correct error, or to further the objectives of the Study. The report also contains a full explanation of each proposed change as well as a statement of reasons for not accepting certain of the suggestions received from interested parties.

_____, Submitting Report, 89 pp., printed, 35 cents. November 15, 1960.

_____, Alphabetical Index of Commodities Provided for in the Proposed Revised Tariff Schedule of the United States, 130 pp., printed, 65 cents, May 20, 1961. Fishery products are among the commodities listed.

_____, Proposed Revised Tariff Schedules of the United States, 831 pp., processed, $4.25, November 15, 1960. Includes fishery products.

_____, Explanatory and Background Materials. Schedule 1--Animal and Vegetable Products, 495 pp., printed, $2.25, November 15, 1960. Includes a section on fish and shellfish.

_____, Explanatory and Background Materials. Schedule 2--Wood and Paper; Printed Matter, 309 pp., printed, $1.50, November 15, 1960.

_____, Explanatory and Background Materials. Schedule 3--Textile Fibers and Textile Products, 630 pp., printed, $3.25, November 15, 1960. Contains a section pertaining to fishing nets.

_____, Explanatory and Background Materials. Schedule 4--Chemicals and Related Products, 473 pp., processed, $2.25, November 15, 1960.

_____, Explanatory and Background Materials. Schedule 5--Nonmetallic Minerals and Products, 416 pp., printed, $2, November 15, 1960.

_____, Explanatory and Background Materials. Schedule 6--Metals and Metal Products, 916 pp., illus., processed, $4.75, November 1960.

_____, Explanatory and Background Materials. Schedule 7--Specified Products; Miscellaneous and Nonenumerated Products, 909 pp., processed, $5, November 15, 1960. Includes fishing tackle and pearls.

_____, Explanatory and Background Materials. Schedule 8--Special Classification Provisions Appendix to the Tariff Schedules, 186 pp., processed, $1,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

November 15, 1960. (Note: All of these Tariff reports are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at the prices indicated for each volume.)

TILAPIA:

"Adaptability of Tilapia nilotica to Various Saline Conditions," by Ruth Lotan, article, Bamidgeh, vol. 12, no. 4, 1960, pp. 96-100, printed. Department of Fisheries and Fish Breeders' Association, Nir-David, D. N., Hakirya, Israel.

"The Culture of Tilapia nigra (Gunther) in Ponds. II--The Influence of Water Depth and Turbidity on the Growth of Male T. nigra; III--The Early Growth of Males and Females at Comparable Stocking Rates, and the Length/Weight Relationship," by Vernon D. van Someren and Peter J. Whitehead, articles, East African Agricultural Journal, vol. 25, no. 2, 1959, pp. 66-72; vol. 25, no. 3, 1960, pp. 169-173, respectively, printed. East African Agricultural Journal, Government Printer, Nairobi, Kenya.

"Laboratory Experiments on the Growth of Tilapia Spp. I--The Value of Various Foods," by C. C. Cridland, article, Hydrobiologia, vol. 15, nos. 1/2, 1960, pp. 135-160, printed. Hydrobiologia, Uitgeverij Dr. W. Junk, The Hague, Netherlands.

TRANSPORTATION:

"Conditions for Use of Aeroplanes for the Transport of Perishable Foodstuffs," article, Bulletin de L'Institut International du Froid, vol. 41, no. 1, 1961, pp. 302-308, printed. International Institute of Refrigeration, 177 Blvd. Malesherbes, Paris 17, France.

TRAWLER-FREEZER:

"La Congelation du Poisson sur 1'Autumn Sun, Chalutier Anglais de 33,5M." (Freezing of Fish Aboard the 33.5-M. English Trawler, Autumn Sun), article, La Peche Maritime, vol. 39, no. 984, 1960, pp. 153-155, illus., printed in French. La Peche Maritime, 190, Boulevard Haussmann, Paris, France.

"The MFV Autumn Sun - Freezer-Trawler," by R. E. Adams, article, Journal of Refrigeration, vol. 3, no. 3, 1960, pp. 59-62, illus., printed. Journal of Refrigeration, Foxlow Publications Ltd., 19 Harcourt St., London W1, England.

"The Smallest Trawler-Freezer in the World," article, Modern Refrigeration, vol. 63, no. 744, 1960, pp. 267-269, illus., printed. Modern Refrigeration, Refrigeration Press Ltd., Maclaren House, Great Suffolk St., London SE1, England.

TRAWLERS:

"Development of a New Stern Trawler," by J. Venus, article, The Motor Ship, vol. 40, no. 474, 1960, pp. 376-378, illus., printed. The Motor Ship, Temple Press Ltd., Bowling Green Lane, London EC4, England.

"A New German High-Seas Trawler," by H. Ofterdinger, article, Die Kalte, vol. 14, no. 1, January 1961, pp. 20-21, printed in German. Die Kalte, Hans A. Keune Verlag, Pressehaus, 1 Speersport, Hamburg 1, Germany.

"The Stern Trawler Universal Star," article, Ship and Boat Builder, vol. 13, no. 17, 1960, pp. 254-255, illus., printed. Ship and Boat Builder, John Trundell Ltd., St. Richards House, Eversholt St., London NW1, England.

"Universal Star, Chalutier de 31 Metres, Equipe pour la Peche par l'Arriere" (Universal Star, a 31-M. Vessel for Stern Trawling), article, La Peche Maritime, vol. 39, no. 983, 1960, pp. 106-107, 109, illus., printed in French. La Peche Maritime, 190 Boulevard Haussmann, Paris, France.

TRAWLING:

"New Type Otter-Boards for Mid-Water Trawl," by Kiichioo Kobayashi and Navichi Inoue, article, Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 11, May 1960, pp. 20-21, printed. Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

"Trawl Fishing in the Tropical Atlantic," by R. H. Lowe and Alan R. Longhurst, article, Nature, vol. 192, no. 4803, November 18, 1961, pp. 620-621, printed, 2s. 6d. (about 40 U. S. cents). Nature, St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y. Discusses exploratory trawling operations in the western and eastern South Atlantic by the Colonial Office vessel, Cape St. Mary. Covers catch rates and composition, analysis of findings, and details of vessel construction.

"Trawling . . . a New Development in the Pennsylvania Commercial Fisheries of Lake Erie," by Alfred Larsen, article, Pennsylvania Angler, vol. 31, no. 1, January 1962, pp. 3-7, illus., printed, single copy 25 cents. Pennsylvania Fish Commission, South Office Bldg., Harrisburg, Pa. According to the author, "Recent trends in the Pennsylvania commercial fisheries have been toward a steady decline in availability of such choice fish as blue pike and whitefish and an increase in the less desirable species such as smelt, gizzard shad, and alewives." The recent introduction of trawling for smelt in the Great Lakes by the U. S. Bureau of Commercial Fisheries may be an answer to the present economic plight of all Lake Erie commercial fishermen. This article discusses recent exploratory fishing cruises for smelt in Lake Erie, operation of the trawl, handling of the fish after capture, processing of the fish, and opportunities for future development of the smelt fishery.

TROUT:

"Hepatoma (Liver Ailment Sparks Vast Research);" and "A Progress Report on Hepatoma," by Howard A. Tanner, articles, U. S. Trout News, vol. 6, no. 4, November-December 1961, pp. 4-5, 21-22, illus., printed. U. S. Trout Farmers Association, 110 Social Hall Ave., Salt Lake City 11, Utah. Discusses the occurrence and probable causes of trout hepatoma, or cancer of the liver, and programs initiated by various Federal and state agencies for its control. This costly disease, in the opinion of researchers, is probably caused by some element in the diet.

"Night Use of a Direct-Current Electric Shocker to Collect Trout in Lakes," by William C. Latta and Gerald F. Myers, article, Transactions of the American Fisheries Society, vol. 90, no. 1, 1961, pp. 81-83, printed. Transactions of the American Fisheries

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Society, Librarian, Colorado A & M College, Fort Collins, Colo.

TUNA:

"Bestimmung des Altersaufbaues des Roten Thunes (Thunnus thynnus (Linnaeus)) in der Nordsee mit Hilfe des Allometrischen Wachstums der Augenhohle" (Determination of Age in the Red Tuna (Thunnus thynnus (Linnaeus)) in the North Sea by the Allometric Growth of the Eye Socket), by Klaus Tiews, article, Archiv fur Fischereiwissenschaft, vol. 11, no. 1, 1960, pp. 11-17, printed in German. Bundesforschungsanstalt fur Fischerei, Hamburg, Germany.

The Migration, Age, and Growth of Pacific Albacore (THUNNUS GERMO), 1951-1958, by Harold B. Clemens, Fish Bulletin No. 115, 125 pp., illus., printed. California Department of Fish and Game, Printing Division, Documents Section, Sacramento 14, Calif., 1961. During January 1952, marine biologists developed the first successful tuna tag. It resembles a piece of spaghetti and has been employed as a research tool for studying the populations of important tuna species. Using these tags, scientists discovered that albacore migrate northward up the west American coast averaging at least 6 nautical miles per day; that they perform a transpacific migration between the American mainland and the Hawaiian Islands and Japan; that their growth rate is relatively rapid, averaging 7 pounds per year for the catch-dominating 13-pound fish; that the natural size groups in the fishery are successive year classes; that individuals and perhaps the same schools return to the American fishing grounds during several seasons; and that there is but one population in the North Pacific. Scientists have also determined the ages of albacore by studying rings on the scales; have obtained valuable data on the time and place of albacore spawning; and have determined their size at maturity. Data obtained from research cruises and specially designed fishermen's logbooks disclosed that albacore abundance is greatest where sea-surface temperatures are 60°-68° F. This information led to discovery of the albacore coastward migration routes and the successful prediction of vast migration route changes in 1958, 1959, and 1960.

"Studies on the Fluctuation in Catch of the Tuna-Fishing Fleet. II--On the Latitudinal Change of the Hooked-Rate of the Albacore and the Striped Marlin in the Fiji Area; III--On the Stomach Contents of Tuna in the Western South Pacific Ocean, Especially in the Fiji Area," by Sigeyuki Koga, article, Bulletin of the Faculty of Fisheries, Nagasaki University, no. 9, 1960, pp. 1-17, printed. Faculty of Fisheries, Nagasaki University, Nagasaki, Japan.

TURKEY:

Balik ve Balikcilik (Fish and Fishery), vol. 9, no. 11-12, November-December 1961, 28 pp., illus., printed in Turkish with English table of contents. Balikcilik Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, the following articles: "Manufacturing of Anchovies of Different Types;" "Tortoises (Testudenata);" and "The Characteristics and Standardization of Sea Origin Oils."

"Gida - Nufus Meselelerimiz" (Our Nutrition and Population Problems), by Suleyman Arisoy, article, Turkiye Iktisat Gazetesi, no. 433, 1961, p. 5, printed in Turkish. Turkiye Iktisat Gazetesi, Posta Kutusu 397, Ankara, Turkey.

"Turkiye'nin Gida Problemi Hakkinda 'Baade Raporu' Uzerinde Dusunceler" (A Thought on Baade's Report in Relation to the Nutrition Problems of Turkey), by Suleyman Arisoy, article, Turkiye Iktisat Gazetesi, no. 400, 1960, p. 5, printed in Turkish. Turkiye Iktisat Gazetesi, Posta Kutusu 397, Ankara, Turkey.

TURTLES:

Maryland Turtles, by Frank J. Schwartz, Educational Series No. 50, 42 pp., illus., printed. Maryland Department of Research and Education, Solomons, Md., May 1, 1961. Discusses the general anatomy and habits of turtles and describes in detail 18 species of turtles found in Maryland. Includes a table showing the volume and value of terrapin and snapper turtles, by gear, captured in Maryland, 1957 and 1958.

UNDERWATER CAMERA:

"A Pressurizing Device for a Camera Case Designed for Use in Shallow Water," by D. J. Scarratt, article, Journal of the Marine Biological Association of the United Kingdom, vol. 41, no. 1, 1961, pp. 77-80, printed. Journal of the Marine Biological Association of the United Kingdom, Cambridge University Press, 200 Euston Rd., London, NW1, England.

U.S.S.R.:

"The Fishing Fleet of the Soviet Union," by Bernard M. Kassell, article, U. S. Naval Institute Proceedings, vol. 87, no. 11, November 1961, pp. 70-81, illus., printed. U. S. Naval Institute, Annapolis, Md. Describes the problem posed for the western world by the growth of Soviet high-seas fisheries. This seems to be a two-pronged problem--one economic and the other strategic. Increased catches by the Soviet wide-ranging fleets are expected to result in decreasing markets for such fish-exporting nations as Iceland. Of strategic concern are the 200 to 400 trawlers and other large Soviet vessels fishing the year round in Atlantic and Pacific waters near the coasts of North America. Plans call for the continued growth of the ocean-going fleet, including the building of 68 factoryships with freezer installations and 47 refrigerated transport ships. In addition, 26 base ships or floating canneries are to be obtained. The majority of the fleet, however, will continue to be comprised of trawlers and seiners.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE FISHERIES RESEARCH BOARD OF CANADA, BIOLOGICAL STATION, ST. ANDREWS, N. B., CANADA.

Development of Methods for Distinguishing Different Kinds of Fishes on Echograms, by A. A. Lovetskaia, V. P. Ovsiannikov, and N. I. Chugunova, Translation Series No. 255, 8 pp., processed, 1960. (Translated from Russian, Voprosy Ikhtiologii, no. 7, 1956, pp. 139-148.)

A First Attempt at Using a Submarine for Observations on the Behaviour of Herring, by D. V. Radakov

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

and B. S. Solovev, Translation Series No. 338, 6 pp., processed, 1961. (Translated from Russian, Rybnoe Khoziaistvo, vol. 35, no. 7, 1959, pp. 16-21.)

Quantitative Study of the Baltic Herring Eggs and Larvae in the Northern Part of the Gulf of Riga and Principal Factors Determining Their Survival, by L. A. Rannak, Translation Series No. 238, 15 pp., processed, 1959. (Translated from Russian, Trudy Vsesoiuznovo Nauchno-Issledovatelskovo Instituta Morskovo Rybnovo Khoziaistva i Okeanografii (VNIRO), vol. 34, 1958, pp. 7-18.)

Submarine Research Expeditions of the SEVERIANKA, by V. P. Zaitsev and V. G. Azhazha, Translation Series No. 339, 7 pp., processed, 1961. (Translated from Russian, Rybnoe Khoziaistvo, vol. 35, no. 7, 1959, pp. 7-16.)

VENEZUELA:
"La Pesca de Esperanza de Venezuela" (Venezuela's Fishery of the Future), by C. R. Chavez, article, El Agricultor Venezolano, vol. 23, no. 216, 1960, pp. 29-31, printed in Spanish. El Agricultor Venezolano, Ministerio de Agricultura y Cria, Caracas, Venezuela.

VESSELS:
Oceanographic Vessels of the World, 700 pp., illus., processed, $4.50, limited distribution. U. S. Navy Hydrographic Office, Washington 25, D. C., 1961. Describes the oceanographic vessels of the world, giving in detail their specifications, their equipment, and their scientific capabilities. Presents details of construction, performance, personnel, propulsion, electrical power, navigation, communication, and echo-sounding equipment, laboratories, habitability, and type of observation. Oceanographic vessels of 66 countries are covered.

VIRGINIA:
Sixty-Second and Sixty-Third Annual Reports of the Commission of Fisheries of Virginia (For the Fiscal Years Ending June 30, 1960, and June 30, 1961), 66 pp., illus., printed. Commission of Fisheries, Newport News, Va. A report showing the amount of revenue derived from the fish and shellfish industries, all the expenditures of the Commission, and the general condition of the fish and shellfish industries under the supervision of the Commission. Statistical tables and reports are included as follows: receipts from fish and shellfish industries; expenditures for administration, enforcement, and restocking work; list of recorded oyster planting ground; areas in which restocking was done; and comparative statements of expense for the past ten years. Includes reports covering the shad-hatching work on the Mattaponi and Pamunkey Rivers for 1960 and 1961. Because of the poor runs of shad, the hatchery on the Chickahominy River again did not operate during the period covered. A report of the Virginia Fisheries Laboratory, Gloucester Point, describes its activities, with special reference to investigations of oysters and oyster drills, blue crab, migratory fish, and the pollution problem.

VITAMIN A:
"Studies on the Economical Manufacture of Vitamin A Concentrate from Fish Liver Oil. II--The Esterification of Alcohol Concentrate and Stability Tests," by Hideo Higashi and others, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, July 1959, pp. 196-203, printed. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-Kaigandori, 6-Chome, Tokyo, Japan.

"Vitamin A Extracts," by R. Matheron, Chemical Abstracts, vol. 52, 665, January 10, 1958.

WATER SAMPLING:
"A Newly Designed Apparatus for Water Sampling at Shallow Depths," by Charles Gainor, article, Ecology, vol. 41, no. 4, 1960, pp. 794-797, printed. Ecological Society of America, Duke University Press, Box 6697, College Station, Durham, N. C.

WHALING:
"International Whaling Commission," by G. R. Clark, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 50, no. 10, October 1961, pp. 411-424, printed in Norwegian and English. Hvalfangerforeningen, Sandefjord, Norway. Comprises the Chairman's Report from the 13th Meeting of the International Whaling Commission, held at London, June 19-23, 1961. Reports on condition of the stocks, the Convention's conservation aims and extra-Convention discussions, the carry-over of Antarctic pelagic whaling quotas, opening date of Antarctic baleen whaling season, and observer plan. Also discusses Antarctic catch limitation, scientific appraisal of Antarctic whale stocks, review of previous season's catch, study of North Pacific stocks, size limits for sperm whales, minimum size of whales to be taken at land stations in Northeast Pacific area, protection of humpbacks, and Greenland whaling. Other subjects covered include humane killing of whales, infractions of regulations, implementing legislation, finances, and and representation at meetings of other organizations.

"Statement from The Federation of Norwegian Whaling Companies," article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 50, no. 11, November 1961, pp. 447-452, illus., printed in Norwegian and English. Hvalfangerforeningen, Sandefjord, Norway.

WHITEFISH:
"Age and Growth of the Whitefish, Coregonus clupeaformis, of Munising Bay, Lake Superior," by Thomas A. Edsall, article, Transactions of the American Fisheries Society, vol. 89, no. 4, 1960, pp. 323-332, printed. Transactions of the American Fisheries Society, Librarian, Colorado A & M College, Fort Collins, Colo.

WHITING:
"Growth and Feeding Habits of the Whiting or Silver Hake in the New York Bight," by Richard H. Schaefer, article, New York Fish and Game Journal, vol. 7, no. 2, 1960, pp. 85-88, printed. New York Fish and Game Journal, New York Conservation Dept., Albany 1, N. Y.

WORLD TRADE:
The following World Trade Information Service Reports, published by the Bureau of Foreign Commerce, U. S. Department of Commerce, Washington, D.C., are for sale by the Superintendent of Documents,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

U. S. Government Printing Office, Washington 25, D. C., at 10 cents a copy.

Food Regulations of Panama, Operations Report No. 61-77, WTIS Part 2, 4 pp., printed, November 1961.

Import Tariff System of Argentina, Operations Report No. 61-82, WTIS Part 2, 2 pp., printed, November 1961.

YELLOW PIKE:
"Age and Growth of Wall-Eyes in Clear Lake, Iowa, 1935-1057," by Kenneth D. Carlander and Richard R. Whitney, article, Transactions of the American Fisheries Society, vol. 90, no. 2, 1961, pp. 130-138 printed. Librarian, Colorado A & M College, Fort Collins, Colo.

PARTY SHRIMP PLATE

2 pounds cooked, peeled, de-veined shrimp, fresh or frozen
2 large cucumbers, sliced
Lettuce

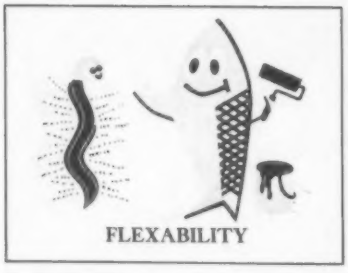
Thaw frozen shrimp. Arrange shrimp on crisp lettuce with cucumber slices. Serve with Party Shrimp Sauce. Yield: about 100 shrimp.

PARTY SHRIMP SAUCE

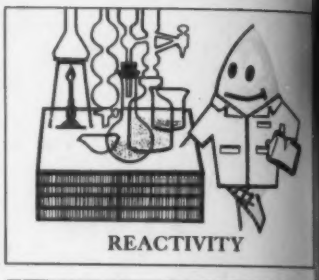
2 cups sour cream
2 tablespoons horse-radish
1 teaspoon salt
1 teaspoon paprika
2 tablespoons grated onion

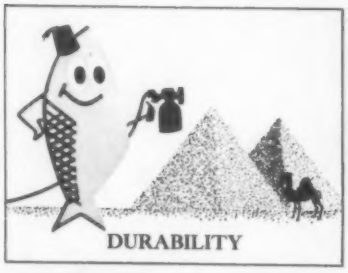
Combine all ingredients and blend well.

BETTER
PAINTS
WITH
MARINE
OILS


FLEXABILITY

VERSATILITY

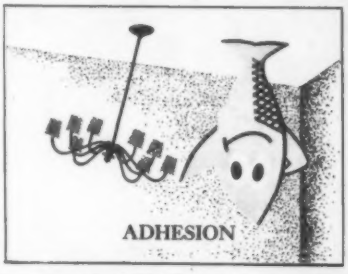

REACTIVITY


DURABILITY

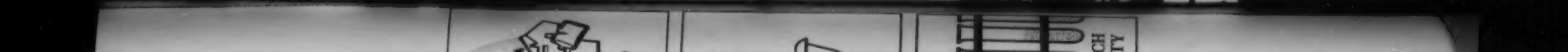
WATER RESISTANCE

DRYING

WETTABILITY


ADHESION

CONTINUOUS RESEARCH
AND UNIFORM QUALITY

ODOR REDUCTION

AND.....LOW COST!